Five-Year Review Report

First Five-Year Review Report
for the
Fields Brook Superfund Site
Ashtabula, Ohio

June 2004

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Fields Brook Superfund Site
Five-Year Review Report
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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
HCB	Hexachlorobenzene
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ODH / BRP	Ohio Department of Health / Bureau of Radiation Protection
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
piC/g	Pico-curies per gram
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
RMI	Reactive Metals Incorporated
$TiCl_4$	Titanium tetrachloride
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The remedies for the Fields Brooks Superfund Site in Ashtabula County, Ohio included the removal of contaminated sediment and floodplain soil from Fields Brook. In addition, remedial actions were implemented at six (6) separate source control operable units to address properties that were contributing additional contamination to the brook or had the potential to do so. Construction completions, based on the approval date for the report summarizing the completion of the remedial action, were achieved, as follows:

Operable Unit		Completion of Remedial Action Date (based upon approval date of final report)
Operable Unit 1 -	Sediment	9/30/2003
Operable Unit 2 -	*Historically known as the Source Control Operable Unit, OU2 was further broken down into OUs 5 - 10 to allow for facility-specific design and enforcement activities. No construction completion date or status is therefore noted for this OU.*	
Operable Unit 3 -	*OU3 was historically the Ashtabula River and Harbor, which is currently being addressed outside of the Superfund program by the Ashtabula River Partnership. No construction completion date or status is therefore noted for this OU.*	
Operable Unit 4 -	Floodplain/Wetlands	9/30/2003
Operable Unit 5 -	Detrex Corporation	*System is operation and functional in that Fields Brook is protected. DNAPL extraction system will be expanded in 2004 to provide long-term protection.
Operable Unit 6 -	Millennium $TiCl_4$ Plant	6/28/2000
Operable Unit 7 -	North Sewers	5/14/2001
Operable Unit 8 -	Acme Scrap Iron and Metal / South Sewers	3/17/2003
Operable Unit 9 -	Conrail Bridge Yard	4/17/2000
Operable Unit 10 -	RMI Metals Property	9/10/2002

This assessment focuses on the decisions made and the work completed in the sediment and floodplain/wetland operable units (OU1 and OU4). The five-year reviews for the six source control operable units (OUs 5 through 10) can be found in the other tabbed sections of this document.

The five-year review for OU1/ OU4 has found that the remedy is protective of human health. Excavations were performed to achieve health-based cleanup levels in brook sediment and floodplain soils. Land uses are still consistent with the assumptions made when determining what areas would be assumed residential and what would be assumed industrial. The collection of Operation, Maintenance and Monitoring (OM&M) samples from the brook will begin in the summer of 2004. This data, and the data from future

years of OM&M sampling will allow U.S. EPA to evaluate the recovery of the brook and more fully judge the protectiveness of the cleanup.

Based upon monthly inspection reports and a site inspection, the on-site landfill appears to be performing adequately. Chemical monitoring will commence in 2004, after the installation of the monitoring wells, and will allow the U.S. EPA to ensure that the landfill is properly containing site-related chemicals.

Five-Year Review Summary Form

Site name *(from WasteLAN)*: Fields Brook Superfund Site

EPA ID *(from WasteLAN)*: OHD980614572

Region: 5 | **State:** OH | **City/County:** Ashtabula / Ashtabula

NPL status: X **Final** ☐ Deleted ☐ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction X **Operating (*Detrex OU*)** X **Complete** (*all other OUs*)

Multiple OUs?* X **YES** ☐ NO

Construction completion dates:

Sediment OU	9/30/2003
Floodplain / Wetland	9/30/2003
Detrex Corporation	Not yet complete
Millennium $TiCl_4$ Plant	6/28/2000
North Sewers	5/14/2001
Acme Scrap Iron and Metal / South Sewers	3/17/2003
Conrail Bridge Yard	4/17/2000
RMI Metals	9/10/2002

Has site been put into reuse? ☐ YES X **NO**

Lead agency: X **EPA** ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: Terese Van Donsel

Author title: Remedial Project Manager | **Author affiliation:** U.S. EPA, Region 5

Review period:** 6 / 4 / 2003 to 5 / 26 / 2004

Date(s) of site inspection: 5 / 6 / 2000

Type of review:

X **Post-SARA** ☐ Pre-SARA ☐ NPL-Removal only

☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead

☐ Regional Discretion

Review number: X **1 (first)** ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA On-site Construction at OU #__

X **Actual RA Start at OU# 6**

☐ Construction Completion

☐ Previous Five-Year Review Report

☐ Other (specify)

Triggering action date *(from WasteLAN)*: 6 / 9 / 1999

Due date *(five years after triggering action date)*: 6 / 9 / 2004

Fields Brook Superfund Site
Ashtabula, Ohio
First Five-Year Review Report

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review. The Ohio Environmental Protection Agency (OEPA) and Ohio Department of Health Bureau of Radiation Protection (ODH / BRP) provided support in the development of this five-year review.

This is the first five-year review for the Fields Brook Site. The remedial action at the Millennium $TiCl_4$ plant triggered this statutory review, because the Millennium remedial action began on June 9, 1999. Although the Conrail operable unit cleanup was completed prior to the Millennium cleanup, the Millennium cleanup had a containment component since waste was sent to the Millennium on-site captive landfill.

Since the Fields Brook Site is a complicated site with many Operable Units (OU), this report has been segmented by operable unit to facilitate the explanation of work performed in each area of the site and the discussion of any issues associated with residual contamination or operation, maintenance and monitoring (OM&M) procedures.

Construction completions for the various operable units were achieved, as follows:

Operable Unit		**Completion of Remedial Action Date (based upon approval date of final report)**
Operable Unit 1 -	Sediment	9/30/2003
Operable Unit 2 -	*Historically known as the Source Control Operable Unit, OU2 was further broken down into OUs 5 - 10 to allow for facility-specific design and enforcement activities. No construction completion date or status is therefore noted for this OU.*	
Operable Unit 3 -	*OU3 was historically the Ashtabula River and Harbor, which is currently being addressed outside of the Superfund program by the Ashtabula River Partnership. No construction completion date or status is therefore noted for this OU.*	
Operable Unit 4 -	Floodplain/Wetlands	9/30/2003
Operable Unit 5 -	Detrex Corporation	* System is operation and functional in that Fields Brook is protected. DNAPL extraction system will be expanded in 2004.
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Operable Unit 9 -	Conrail Bridge Yard	4/17/2000
Operable Unit 10 -	RMI Metals Property	9/10/2002

Operations, maintenance and monitoring will continue indefinitely at the Fields Brook landfill. Routine monitoring of brook sediment and floodplain soils will continue, according to the terms of the Consent Decree, in order to evaluate the health of the brook. For purposes of this five-year review, historical issues related to OU1 and OU4 will be discussed separately to reflect the separate investigative and administrative paths of each operable unit. However, since sediment and floodplain remediation was performed in parallel and excavated materials is co-mingled in the on-site landfill, discussions related to the brook cleanup and any future work associated with OU1 and OU4 will be discussed together.

Details concerning the five-year reviews of the six source control operable units can be found in the source control sections of this document. In summary, the source control evaluations found that all six source control operable units are protective of human health and the environment relative to the scope of the cleanups, which was to protect Fields Brook from recontamination above the cleanup goals (CUGs) for sediment. The source control cleanups were not developed to address human health or ecological risks within each source control area. While U.S. EPA limited the required source control actions to those necessary to protect Fields Brook, some of the cleanups (such as at Conrail and the Millennium $TiCl_4$

Plant) incorporated health-based cleanup levels to minimize operations and maintenance (O&M) and long-term liability. Specifically, the reviews found:

Monitoring requirements will continue at Acme Scrap Iron and Metal and South Sewers operable units to ensure that soil erosion into the storm sewer system does not lead to the release of sediment in excess of the brook cleanup goals.

No independent monitoring under Superfund is required at the Millennium $TiCl_4$ facility. Monitoring at the Millennium landfill is being performed subject to Millennium's permit with the Ohio EPA. Monitoring requirements for PCBs and radium are included in the landfill's monitoring program.

Operations, maintenance and monitoring will be implemented at the Detrex Corp., operable unit as Detrex works to expand the current DNAPL extraction system and impr[illegible].

No operations, maintenance or monitoring efforts are required for the Conrail, RMI Metals and North Sewers operable units. Institutional controls need to be implemented for the North Sewers operable unit, as required by the ROD.

II. Site Chronology

Event	Date
Record of Decision for the Fields Brook Sediment Operable Unit	September 30, 1986
Record of Decision for the Floodplain / Wetland Operable Unit	June 30, 1997
Explanation of Significant Differences – Sediment Operable Unit	August 15, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the RD/RA for the Sediment and Floodplain / Wetland Operable Units	December 17, 1997
Site-Wide Explanation of Significant Differences Modifying the Decisions for the Sediment, Floodplain/Wetland and Source Control Operable Units (addition of radionuclide cleanup requirements)	April 8, 1999
Consent Decree lodged for Performance of Remedial Design and Remedial Action for OU1 / OU4	May 14, 1999
Consent Decree entered for Performance of Remedial Design and Remedial Action for OU1 / OU4	July 7, 1999
U.S. EPA approves Remedial Design / Commencement of Remedial Action	August 9, 2000
PRP Contractor Mobilization at the Site	April 28, 2000
Start Landfill Excavation	May 25, 2000
Start Liner Installation	July 20, 2000
Complete Landfill	September 6, 2000
Begin Excavation in OU1 / OU4	September 22, 2000
Encounter DNAPL / Commence Shutdown	October 16, 2000
DNAPL Investigation	October 2000 – March 2001

Event	Date
Re-commence excavation activities in OU1 / OU4	May 7, 2001
Explanation of Significant Differences to address the presence of DNAPL-impacted soil and sediment.	August 17, 2001
Begin Thermal Treatment with Soil Pure	October 19, 2001
Soil Pure Left Site	November 2001
Thermal treatment resumed with ESMI of New York – commence trial runs to prepare for performance demonstration	June 17, 2002
Thermal treatment shutdown pending approval of performance demonstration plans and scheduling of trial burn	August 2, 2002 – September 29, 2002
Performance Demonstration Performed	October 8 – 10, 2002
Site Mitigation - Placement of Plantings	October 2002 – March 2003
Complete Sediment and Soil Excavation	December 17, 2002
Thermal treatment completed	December 20, 2002
Demobilization	December 2002 – February 2003
Conditional Approval of Final Construction Report	September 30, 2003
U.S. EPA Approval of Quality Assurance Project Plan for OM&M	March 19, 2004
U.S. EPA Approval of OM&M Work Plan	May 4, 2004

III. Background

Physical Characteristics

The Fields Brook Site (Site) is located in northeast Ohio, in Ashtabula County, approximately 55 miles east of Cleveland, Ohio [See Figure 1]. Fields Brook drains a six square-mile watershed. The eastern portion of the watershed drains Ashtabula Township and the western portion drains the eastern portion of the city of Ashtabula. The main channel is 3.9 miles in length and begins at Cook Road, just south of the Penn Central Railroad tracks. From this point, Fields Brook flows northwest to Middle Road, then west to its confluence with the Ashtabula River. From Cook Road downstream to State Route 11, Fields Brook flows through an industrialized area. Downstream of State Route 11 to near its confluence with the Ashtabula River, Fields Brook flows through undeveloped and residential areas in the City of Ashtabula. Fields Brook discharges to the Ashtabula River approximately 8,000 feet upstream from Lake Erie [See Figure 2].

Land and Resource Use

The industrial zone of Ashtabula is concentrated around Fields Brook and is comprised of several chemical industries and waste disposal sites. Manufacturing has occurred since the early 1940's in this area. Activities ranging from metal-fabrication to production of complex chemical products

occurred on approximately 18 separate industrial properties, and the decades of industrial activity along Fields Brook and its tributaries resulted in the release of chemical contamination to the Fields Brook watershed, particularly the sediments of Fields Brook, the floodplain soils and sediments, and the soils surrounding the industries.

History of Contamination

In the last 60 years, the industrial area of Fields Brook has been the location of manufacturing activities ranging from metal-fabrication to chemical production. Brook sediments and floodplain soils were contaminated with polychlorinated biphenyls (PCBs), radionuclides, chlorinated benzene compounds, chlorinated solvents, hexachlorobutadiene, polyaromatic hydrocarbons (PAHs), arsenic, and other hazardous substances.

Initial Response

The Fields Brook Site was placed on the National Priorities List (NPL) for hazardous waste sites on September 8, 1983. The site consists of Fields Brook, its tributaries, and any surrounding areas which contribute, potentially may contribute, or have contributed to the contamination of the brook and its tributaries. The site is a multi-source site and involves multiple media, including soil, sediment, groundwater and surface water.

Early in the remedial investigation process, the U.S. EPA divided the Fields Brook site into four areas of concern, three of which have been designated as "operable units" (OUs) associated with the Fields Brook Superfund site. The Sediment OU (OU#1) involves the cleanup of contaminated sediment in Fields Brook and its tributaries. The Source Control OU (OU#2) involves the location and cleanup of sources of contamination to Fields Brook to prevent recontamination of the brook and adjacent floodplains/wetlands area. These OU#2 areas ultimately became operable units 5 through 10). The Ashtabula River Area of Concern (OU#3) includes contaminated areas of the Ashtabula River and harbor. The cleanup of the Ashtabula River and harbor is currently being addressed outside of the Superfund process by the Ashtabula River Partnership, which is a public/private partnership that is pursuing a cleanup under the Water Resources Development Act. Pending the availability of WRDA construction funds, the Ashtabula River Partnership is also pursuing funding through the Great Lakes Legacy Act. The Floodplain/Wetland OU (OU#4) encompasses contaminated soils and floodplain sediments located within the 100-year floodplain area surrounding Fields Brook and outside of the channel and sideslope areas of Fields Brook.

Between April 1983 and July 1986, the U.S. EPA performed a Remedial Investigation/Feasibility Study (RI/FS) for the Sediment Operable Unit. U.S. EPA completed the RI Report in March 1985 and the FS report in July 1986. The RI included a baseline human health risk assessment which demonstrated human health risks for the brook sediment. The FS Report described several alternatives for remedial action of the Sediment Operable Unit. In 1986, U.S. EPA issued a ROD for the Sediment Operable Unit.

The 1985 RI also addressed health risks from exposure to soils in the floodplain area adjacent to Fields Brook. In 1993, the PRPs initiated a voluntary assessment of the nature and extent of

contamination in the Floodplain/Wetland Area of Fields Brook. The PRPs conducted three rounds of Floodplain/Wetland soil sampling, additional flora and biota sampling and field investigations, and a wetland survey which identified the size and location of wetlands that could be affected by the Fields Brook cleanup. The PRPs' investigation of the Floodplain/Wetland Operable Unit was conducted under the oversight of U.S. EPA, Ohio EPA and the USACE and was completed by the spring of 1995. After completion of the site investigation, the PRPs prepared a FS to evaluate cleanup alternatives. The FS report was finalized in October 1996. In July 1997, U.S. EPA issued the ROD for the Floodplain/Wetland Operable Unit.

Because it was recognized that the cleanup of the Fields Brook sediment should not be performed unless the source(s) of contamination are addressed prior to the cleanup, the U.S. EPA required the PRPs to investigate the industrial area of Ashtabula. From 1992 to 1995, the PRPs evaluated 94 properties in the Fields Brook watershed to determine whether the properties could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater. As a result of the Source Control evaluation, the U.S. EPA identified six industrial areas as possible sources of recontamination to Fields Brook. Detailed information about the types and extent of contamination at the source areas can be found in the Source Control RI Report, which was approved by U.S. EPA in May of 1997. In conjunction with the preparation of the Source Control RI report, the PRPs prepared a Source Control FS to identify and evaluate cleanup alternatives. The Source Control FS was finalized in June, 1997, with the Source Control ROD issued on September 29, 1997. To improve continuity of discussions, the Five-Year Reviews for the six source control operable units of Fields Brook are presented in separate sections of this document. Please see the Table of Contents for the location of the source control reviews.

IV. Remedial Actions

Remedy Selection

A. Sediment Operable Unit

The response action selected in the 1986 Sediment ROD involved excavation and containment of contaminated sediments within an on-Site landfill, and on-Site thermal treatment of the significantly contaminated or mobile sediments. Specifically, the 1986 ROD included the following components:

1) excavation of organically contaminated sediment with a greater than $1x10^{-6}$ excess lifetime cancer risk level, and inorganically contaminated sediment to health based levels or background levels, whichever was higher;

2) construction of an on-Site RCRA/TSCA landfill with separate cells for solidified sediments, solidified sediments containing arsenic, and a temporary storage cell for sediment to be thermally treated;

3) on-Site thermal treatment of both excavated sediments which are above 50 ppm PCB's, and sediments with high potential for mobility which have a soil/water partition coefficient (koc) of below 2400. Treated material would be disposed via landfilling in either: a) the on-Site landfill if analysis of the ash from thermal treatment indicates it requires management as a hazardous waste; or b) in the on-Site landfill or in an off-Site solid waste landfill if analysis of the ash from thermal treatment indicates it does not require management as a hazardous waste. The ROD estimated 16,000 cubic yards of sediment would be thermally treated;

4) solidification of the remaining quantity of excavated sediment, and disposal via landfilling in the on-Site landfill. The ROD estimated sediment volume before solidification was 24,000 cubic yards;

5) treatment of wastewaters generated during construction activities in an on-Site treatment system, with discharge to the Ashtabula Publicly Owned Treatment Works or directly to Fields Brook;

6) completion of various pre-design studies;

7) operation and maintenance of the remedy;

8) completion of a Remedial Investigation/Feasibility Study to address any ongoing sources of contamination to Fields Brook; and

9) completion of an investigation to address the nature and extent of contamination in the Ashtabula River.

As a result of discussions with and information provided by the PRPs and information from pre-design studies, an Explanation of Significant Differences was issued in August of 1997 to refine the work to be performed as part of the Fields Brook sediment cleanup. The following significant changes were made to the remedial action:

1) elimination of solidification requirements for excavated sediments landfilled on-Site;

2) thermal treatment of the excavated sediments would be conducted at an off-Site facility instead of at an on-Site facility;

3) refinement of the cleanup goals/standards for the sediment to be excavated;

4) reduction of the excavated sediment estimated total volume from 52,000 cubic yards to 14,000 cubic yards, including a reduction of the estimated thermal treatment sediment volume from 16,000 cubic yards to 3,000 cubic yards; and

5) elimination of the chemical waste landfill requirement of Section 761.75(b)(3) which specifies a fifty foot distance between the bottom liner and the historical high water table.

When the remedial design for the cleanup of the Fields Brook sediment and the floodplain/wetland soils was approximately 90% complete stage, the U.S. EPA received information regarding possible radionuclide contamination in the Ashtabula River and the Fields Brook watershed. U.S. EPA evaluated the available data and the PRPs, under U.S. EPA and Ohio Department of Health Bureau of Radiation Protection oversight, conducted follow-up sampling. The results of the sampling identified unacceptable levels of radium at the Millennium facility and in floodplain/wetland soils near the Millennium facility. Levels of radium in Fields Brook sediment appeared relatively low, but were slightly above what would be expected for background. U.S. EPA determined that radium should be added as a contaminant of concern for the cleanup of the Millennium facility and for the Fields Brook sediment and the floodplain/wetland soils. In addition, because of the presence of radium, specific components of the remedial action were modified to address soils and sediment that contain radium. The 1999 Site-Wide ESD made the following modifications in the cleanup requirements for brook sediment and floodplain soils:

1) thermal treatment (incineration and/or low-temperature thermal desorption) was not appropriate for sediment that contains levels of radium (and other radionuclides) above background. For sediment with background levels of radionuclides, off-site thermal treatment would proceed as planned. For sediment with levels of radionuclides above background, the sediment would be chemically stabilized prior to disposal in the on-site landfill.

2) the design of the on-site landfill built to contain site soils and sediment from SOU and FWOU was upgraded. Monitoring wells around the landfill are to be routinely sampled, and the samples will be analyzed for radionuclides. Air monitoring is to be performed at the landfill to ensure that levels of radon gas emanating from the landfill do not present any risk to human health.

3) additional soil and sediment would be excavated from the site to meet the radium cleanup level of 5 pCi/g above background, for combined levels of radium-226 and radium-228 for residential areas and 10 pCi/g above background for combined levels of radium-226 and radium-228 in industrial areas of the site.

4) consistent with the decommissioning project at the RMI Extrusion property (adjacent to Fields Brook), U.S. EPA utilized a 30 pCi/g cleanup level for uranium (U-238) in floodplain soils and brook sediment.

In the summer of 2000, the Fields Brook landfill was constructed and cleanup of the Sediment and Floodplain /Wetland Operable Units began. In the fall of 2000, during excavation of brook sediments, an underlying layer of DNAPL was found below brook sediments and floodplain soils. This DNAPL layer was composed of volatile and semi-volatile organic compounds previously identified and evaluated as part of the Sediment Operable Unit. These previously identified site contaminants were found in the layer of DNAPL, but at higher concentrations and in a greatly

increased volume of material than had been anticipated. Instead of periodic pockets of sediments with high levels of chlorinated organic compounds, liquid DNAPL was observed at a depth of approximately 6 to 8 feet below ground surface, perched on top of a stiff clay layer that is natural to the area. An ESD was issued in August of 2001 to address the newly-identified volume of material. Because the volume of highly-contaminated material at the site had significantly increased with the DNAPL discovery, it now made financial sense to reverse the earlier ESD that had moved the thermal treatment off-site. Therefore, the ESD made the following modification to the Sediment OU cleanup requirements:

1) on-site thermal treatment of DNAPL-impacted soils

2) supplemental field sampling and pre-treatment monitoring to ensure that soils to be thermally treated do not contain elevated levels of radionuclides; and

3) off-site thermal treatment of liquid DNAPL.

B Floodplain/Wetland Operable Unit (OU#4)

The major components of the 1997 selected remedy for the Floodplain/Wetland OU included:

1) excavation or cover of contaminated soils and sediments in the FWA that exceed cleanup action levels; backfill of all excavation and cover areas with hydric-compatible soil;

2) removal of all trees in excavation areas, and removal of all trees below 12" diameter at basal height in cover areas, with vegetation in response areas considered contaminated, and with live vegetation above ground surface considered clean if it can be decontaminated;

3) revegetation of all backfill and cover areas, and revegetation of all areas disturbed during construction, using erosion mats and native vegetation;

4) construction of a temporary access road to allow access to and along the floodplain from the roadways during construction, made of crushed stone and 1/4-inch thick geonet liner, and to be removed after construction and disposed of either in the on-site landfill or if clean in other on-site or off-site areas;

5) consolidation of excavated soils and sediments, construction debris, and roadways constructed to implement the remedy if determined to be contaminated, within an on-site fenced-in containment cell (landfill) to be built on one of the industrial properties located within the Fields Brook watershed;

6) construction of a minimum of three downgradient wells and one upgradient well to monitor the long-term effectiveness of the landfill;

7) long-term operation and maintenance and post closure care of the remedial action to help ensure its effectiveness;

8) long-term monitoring including sampling of Flodplain/Wetland surface soils and sediments, and backfill and cover areas, and monitoring of wetland conditions at specific locations and for parameters defined in the Record of Decision Summary, to verify the effectiveness of the remedial action;

9) placement of institutional controls on deeds and title for properties where: contamination will remain in the Floodplain/Wetland; the landfill will be constructed; or hazardous substances, pollutants or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. For the landfill, the deed restrictions must prevent residential, industrial or other development on the landfill. For all other properties, the deed restrictions must provide notice to any subsequent purchaser or prospective developer of the presence of hazardous substances and of the requirement to conduct all development activities in such a manner as to not release contamination towards Fields Brook; and

10) implementation of access restrictions, including enclosing the entire landfill area with a fence and posted warning signs.

During the Remedial Design process, it was determined by all parties that the 6" soil cover was impractical since inspection and long-term maintenance would be difficult. Therefore, the PRPs voluntarily agreed to excavate all soils in the residential area of the Floodplain/Wetland OU that contained 6 ppm or greater total PCBs.

During the preparation of the Remedial Design for the Floodplain/Wetland area, the issue of radionuclides arose. The Floodplain/Wetland RD required modifications due to the discovery of radionuclides. As discussed in Section V(A) above, the 1999 Site-Wide ESD added cleanup criteria for radionuclides (specifically, radium and uranium). In addition, the discovery of DNAPL below the brook and floodplain in the fall of 2000 impacted remedial work on the Floodplain/Wetland OU. The August 2001 ESD allowed the on-site thermal treatment of DNAPL-impacted soil and sediment.

Remedial Actions

Since the issuance of the Unilateral Administrative Order for RD/RA for OU#1 and OU#4 (and the subsequent negotiation of a Consent Decree between U.S. EPA and the site PRPs), the sediment and floodplain/wetland operable units have been addressed together for design and construction. This made sense because the cleanup of the streambed and adjacent floodplain would be performed as a single project. In addition, during the early phase of the remedial design process, the U.S. EPA, U.S. Department of Justice and the PRPs worked together to negotiate a Consent Decree for the RA/RA scope. The Consent Decree was lodged on May 14, 1999 and entered on July 7, 1999. Upon entry of the Consent Decree, the Unilateral Administrative Order for OUs 1 and 4 was vacated.

The design work that began in 1998 built on earlier conceptual design work for the brook sediment. Design reviews were conducted by U.S. EPA and the U.S. Army Corps of Engineers. The 100% Remedial Design for OU#1 and OU#4 was approved on August 9, 2000. Remedial Design work began with Harding Lawson as the design contractor for the PRPs. Due to business reorganization and the loss of key personnel, the PRPs ultimately utilized Conestoga Rovers and Associates (CRA) as the prime contractor for the RD/RA work.

The remedial design for the Sediment and Floodplain/Wetland Operable Units was based on a area-wide averaging approach. Using the assumption that no person would be repeatedly exposed to the exact same area for a long period of time, the remedial design allowed an averaging approach over areas. For the Sediment Operable Unit, the 1986 ROD and 1997 ESD together served as the basis for the selection of Cleanup Goals (also known as "CUGs") for contaminants of concern. Based on the cleanup goals, Confidence Removal Goals (CRGs) were calculated to guide the necessary excavation in each exposure area of the brook. By excavating to the CRGs, the resulting average concentration of residual contamination should be equal to the CUGs. The remedial design utilized a significant volume of existing data on brook contamination to develop cut lines based on the CRGs. Ultimately, once radionuclides were discovered and "do not exceed" criteria were established for radium and uranium, the resulting cleanup of chemical contamination in the Sediment OU was expected to be more conservative than originally planned. For industrial areas of the brook, a sediment cleanup standard of 10 pCi/g total radium (ra-226 + ra-228) above background was established. For residential areas, sediment would need to meet a standard of 5 pCi/g of total radium above background. A uranium standard of 30 pCi/g was established for the entire brook (residential and industrial) to be consistent with the U.S. Department of Energy cleanup of the RMI Extrusion facility.

For the Floodplain/Wetland Operable Unit, two indicator parameters were initially established to guide the cleanup. PCBs and hexachlorobenzene were the driving risks in the floodplain. Performing a cleanup based on the presence of these two chemicals was expected to yield a thorough cleanup of all contaminants of concern in the OU. Similar to the Sediment OU, the remedy for the Floodplain/Wetland OU envisioned that an area-wide averaging approach would result in a protective cleanup. As part of the remedial design, additional chemical sampling was performed in the floodplain. The remedial design then developed grid-based excavation cut lines based on PCB and hexachlorobenzene contamination. In industrial areas of the brook, areas with total PCB concentrations at or above 50 ppm and/or a hexachlorobenzene concentration of 200 ppm were to be excavated. In residential areas, grids with 6 ppm total PCBs and/or 80 ppm hexachlorobenzene required excavation. As with the Sediment OU, the identification and ultimate excavation of additional soils due to radionuclide contamination is thought to have further reduced residual chemical contamination to even lower levels. For industrial areas of the floodplain, a cleanup standard of 10 pCi/g total radium (ra-226 + ra-228) above background was established. For residential areas, soils would need to meet a standard of 5 pCi/g of total radium above background. A uranium standard of 30 pCi/g was established for all floodplain soils (in both residential and industrial areas) to be consistent with the U.S. Department of Energy cleanup of the RMI Extrusion facility.

Remedy Implementation

Remedial action work began in the field on May 25, 2000 with the construction of the on-site "TSCA-equivalent" landfill. This "Fields Brook landfill" was built for the disposal of all excavated Fields Brook sediment and floodplain soils that did not require thermal treatment. In addition, the on-site landfill was to be made available to the PRPs for disposal associated with the remediation of the Source Control Operable Units. Landfill construction was completed on September 6, 2000.

Excavation began in the brook on September 22, 2000. Excavation of contaminated soil and sediment continued until October 16, 2000 when DNAPL was discovered under brook sediment and floodplain soils in the upper industrial reaches of the brook. Additional field investigations were performed to determine the extent of the problem and estimate the volume of additional material that would require thermal treatment. Since the volume of DNAPL-impacted material was significantly greater than the small volume that otherwise would have been set-aside and shipped off-site for thermal treatment, the U.S. EPA and PRPs evaluated the situation. While the Fields Brook PRPs were investigating the extent of DNAPL and recalculating excavation cut lines, the U.S. EPA was dealing with the technical and administrative requirements necessary to adjust the remedy to the extent of DNAPL-impacted soil and sediment found at the site. On May 7, 2001, excavation work recommenced in other areas of the brook while work within the DNAPL-impacted areas remained on hold. The U.S. EPA ultimately issued the August 17, 2001 ESD to address the volume of DNAPL-impacted material and allow on-site thermal treatment of the material.

The Fields Brook PRPs proposed an on-site thermal treatment system that utilized low temperature thermal desorption for contaminant destruction. While not a typical incinerator, U.S. EPA made the determination that such a unit would still need to meet the requirements of Subpart O. The PRPs proposed a thermal desorption unit through the vendor SoilPure. The SoilPure process was reviewed by U.S. EPA (including a thermal treatment specialist out of U.S. EPA's technical support office in Cincinnati) and the USACE. Because the Subpart O regulations allow the processing of material in advance of a trial burn (so that the processor can learn how best to handle the material and optimize the process), SoilPure was allowed to commence operation at the site. Operations began with a trial of clean soil and advanced to contaminated material. During that time, U.S. EPA reviewed and commented on a Performance Demonstration Work Plan and Quality Assurance Project Plan (QAPP). Before the Work Plan and QAPP could be finalized, SoilPure encountered financial difficulties and SoilPure personnel ceased work at the site in November of 2001, leaving the equipment in place and idle at the site. Because this was not an expected event, the PRP group was forced to quickly identify another thermal treatment contractor. The PRPs selected EMSI of New York as the replacement thermal treatment contractor. ESMI setup its equipment at the site, processed uncontaminated and contaminated material from the site to evaluate treatment issues, and submitted a Work Plan and a QAPP for a performance demonstration at the site. EMSI commenced operations at the site at a feed rate less than planned for the trial burn (and therefore with a greater retention time). A trial burn was conducted at the site in October of 2002. By the time the results of the trial burn were available, virtually all of the contaminated material had been treated at the site. The results of the trial burn found that the unit

had met all emissions requirements but failed to obtain the "four nines" (99.99%) Destruction Removal Efficiency (DRE) required under Subpart O for hexachloroethane. For the three runs of the trial burn which ran at their hoped-for operational feed rate, the system was able to achieve an average DRE for hexachloroethane of 99.67%. Because the hexachloroethane DRE had not been met at the increased feed rate, the system completed the small amount of remaining material at a reduced feed rate in order to maximize treatment time. The operation of the EMSI thermal desorption unit ceased on December 20, 2002.

The excavation of Fields Brook sediment and floodplain soils continued until December 16, 2002. Upon placement of the final materials in the landfill, the landfill was closed. Contractor demobilization was complete by February 2003.

At completion, 53,094 cubic yards of contaminated sediment and floodplain soil were excavated from Fields Brook. Of this, 1,435 cubic yards of contaminated sediment and floodplain soil were sent off-site for thermal treatment (before the discovery of the DNAPL-impacted area and the issuance of the ESD allowing on-site treatment). Approximately 20,420 cubic yards of contaminated soil and sediment were thermally treated on-site. Treated soils were utilized for backfill on-site. Approximately 30,514 cubic yards of excavated sediment and floodplain soil were sent to the on-site landfill, which ultimately housed not only material from the brook, but from many of the source control cleanups as well.

Site mitigation in the brook and floodplain was performed in late 2002 and completed in March 2003. In addition to the normal seeding and planting of impacted areas, the PRPs worked with the U.S. EPA and the Ohio EPA to determine what additional activities would be necessary to allow the stream and floodplain system to return to a natural state. Mitigation activities included the addition of willow snags in the brook, the placement of logs horizontally on the ground to provide habitat, and the vertical placement of logs to provide perches for raptors. Vegetation and wildlife have begun to return to the area. Unfortunately, some of the logs that were placed at the site ended up being utilized by residents as firewood.

System Operation/Operation and Maintenance

The Operation, Maintenance and Monitoring Plan (OM&M) for the Sediment and Floodplain/Wetland Operable Units was approved on May 4, 2004 and addresses post-remediation sampling within the brook, in terms of both scope and the duration. Sediment and floodplain/wetland soils will be sampled and analyzed to monitor the recovery of the brook. Samples will be taken from backfill areas within the floodplain and streambed (where excavation has occurred and clean fill materials have been placed) to ensure that residual levels of contamination have not contaminated what should be clean areas. In addition, samples will be taken from areas that were not excavated to ensure that health-based levels are not exceeded and to track what is expected to be a long-term reduction in residual contaminant levels (based erosion and dispersion of residual contaminated soil and sediment).

In addition to the sampling within the brook, the OM&M Plan (and associated QAPP) includes long-term activities associated with the upkeep of the Fields Brook on-site landfill. The OM&M

Plan includes the sampling regime for the groundwater monitoring wells around the landfill, the inspection and routine maintenance associated with the landfill cover, and the collection and disposal procedures for leachate. The air monitoring requirement to check for emissions of radon at the landfill (cited earlier in this document) has been eliminated and is not required at part of OM&M. The OM&M QAPP was approved by U.S. EPA on March 19, 2004. The OM&M Plan was approved on May 4, 2004.

Since the OM&M Plan and associated QAPP were not approved until recently, the PRPs have been operating under the draft plan. Landfill inspections have been occurring on a monthly basis. In addition, since closure of the landfill, leachate levels are checked on a monthly basis, with leachate collected, sampled and disposed as needed. See Table Brook-1 for monthly landfill inspection reports dating from April 2003 to April 2004.

Monitoring wells will be put in around the landfill in the early summer of 2004. OM&M sampling in the brook will be conducted in the summer of 2004.

V. Progress Since the Last Five-Year Review

This is the first Five-Year Review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA, the ODH/BRP and the potentially responsible parties for the Sediment and Floodplain/Wetland operable units, were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Chuck McCracken, ODH/BRP
Robert Rule, *de maximis, inc.*

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency and the ODH/BRP that the five-year review was being prepared. A news release was issued to all local news media on April 25, 2004.

No community interviews were conducted as part of the five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook and floodplain.

Document Review/Data Review

The following documents were reviewed:

- Record of Decision for the Sediment Operable Unit, September 30, 1986;
- Explanation of Significant Differences for the Sediment Operable Unit, August 15, 1997;
- Record of Decision for the Floodplain/Wetland Operable Unit, June 30, 1997;
- Site-Wide Explanation of Significant Differences, April 5, 1999;
- Explanation of Significant Differences to address DNAPL-Impacted Soils and Sediment, August 17, 2001; and
- Completion of Remedial Action Report, dated August 2003, with page revisions dated March 2004.

A site inspection of the Fields Brook site, including the brook channel and floodplain and the on-site Fields Brook landfill, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. Based upon the available information, the remedy is protective of human health and the environment. Although OM&M data have not yet been collected, since soil and sediment was excavated based on cut lines determined by health-based cleanup levels, the assumption can fairly be made that the remedy is performing adequately. There is always some uncertainty however, since real-time sampling data was not used for cut line determinations. Therefore, depending on the age of the data point that drove a particular cut line, there is a possibility that the movement of soil and sediment within the stream channel could have modified the extent of contamination prior to excavation. This issue will not be able to be evaluated until OM&M data is available. Since OM&M sampling is not extensive in comparison to the available RI data, multiple years of OM&M data will be necessary to assess residual contaminant levels in the brook. On the other hand, it very possible that the cleanup of the brook has led to residual contaminant levels below what was envisioned. The removal of radium-impacted soils and sediment removed soils that had organic contamination at levels below the confidence removal goal (CRG). This reduces the overall average within each exposure unit leading to a more conservative cleanup for chemical contaminants.

At the Fields Brook landfill, monthly inspections and leachate collection have not identified any major issues that call into question the performance of the landfill. An inspection of the Fields Brook site, including the brook channel and floodplain and the on-site Fields Brook landfill, was

conducted on May 6, 2004. No action items for the sediment and floodplain/wetland operable units were identified based on this inspection. The landfill cover is in excellent condition, the property is fully fenced with locked gates, and procedures are in place to document entry and exit into the site. Chemical monitoring of groundwater around the perimeter of the landfill will commence once OM&M wells are installed in the summer of 2004.

Recently planted vegetation within the brook is taking hold and the appearance of the brook is improving. An actual evaluation of the health of the brook can only be determined after a review of OM&M sampling data from brook sediments and floodplain soils.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes, the exposure assumptions for the residential and industrial areas of the brook are still valid. Land use along the brook is still consistent with the assumptions used to determine where residential and industrial cleanups would be performed.

The sediment CUGs were based on the ingestion of sediments during direct contract with Fields Brook. Screening risk calculations showed that the other possible exposure routes which were considered in the FS (dermal absorption and inhalation) were insignificant when compared to the ingestion exposure route. Ingestion would occur inadvertently from hand to mouth activity by persons having soils or sediments on their hands due to contact with the Brook sediments. Inhalation was eliminated because volatilization and particulate emissions from Brook sediments which may mostly be wet will not be significant. Dermal absorption risk was also relatively small compared to direct ingestion risk. Thus, during the RI/FS phase, U.S. EPA determined that CUGs based on the sediment ingestion exposure route would also assure protectiveness from the other human health exposure routes associated with the Brook sediment. The sediment CUG for PCBs was 1 ppm on average for residential areas of the brook and 3.1 ppm on average for industrial areas of the brook. For HCB, the sediment cleanup goals was set at 6.38 ppm on average for residential areas and 15 ppm on average for industrial areas of the brook.

Regarding the need to be protective of ecological receptors at the site in relative to the sediment CUGs, the U.S. EPA prepared a "Focused Ecological Risk Assessment" in 1997 to estimate post-remediation risk levels to ecological receptors such as mink which are or may be exposed to the Brook. This focused assessment indicated the potential for significant risks to ecological populations associated with exposure to PCBs and HCB. The assessment concludes that hazard quotient (HQ) calculations for post-remediation average concentrations may exceed 1 for several species evaluated. However, U.S. EPA believes that the Sediment operable unit remedy implemented at the site will be protective of the various populations of ecological receptors which exist within the brook or rely upon food sources associated with the brook. The response actions that have been taken have reduced the short- and long-term risks to ecological populations. The combined cleanup for PCBs, HCB and radionuclides has resulted in a cleanup that on average exceeds the CUG requirements.

The CUGs for the Floodplain/Wetland operable unit were developed based on both human health and ecological considerations. Within both the residential and occupational scenarios, the potential for cumulative chemical intake resulting from multiple-exposure routes was evaluated. The CUG calculation was made based on exposure from incidental ingestion of soil and dermal absorption of contaminants in soil. The PCB CUGs for the floodplain/wetlands operable unit were1 ppm on average in residential areas and 6 to 8 ppm on average in industrial areas. The CUGs for the HCB in the floodplain/wetland operable unit were 0.8 ppm on average in residential areas and 6.7 ppm on average in industrial areas.

Radionuclide cleanup levels in sediment and floodplain/wetland soils were based on human health considerations. For residential areas, a cleanup level for combined radium-226 and radium-228 was set at 5pCi/g above background. For industrial areas, the cleanup level was set at 10 pCi/g above background for combined radium-226 and radium-228. For consistency, the uranium cleanup standard set for the brook sediment and floodplain soils was based on the cleanup level utilized at the adjacent RMI Extrusion plant that is currently undergoing DOE decommissioning. U.S. EPA evaluated the 30 pCi/g cleanup level and verified that it was acceptable for land use along the brook. U.S. EPA is confident that the assumptions used to develop the radionuclide cleanup levels remain valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. Based on RI and design information, U.S. EPA believes that the remedy is protective. Collection of OM&M data will begin this year and will allow the U.S. EPA to more fully address the recovery of the brook and the performance of the on-site landfill. Based on a five-year review of assumptions made during the development of sediment CUGs, it is clear that the availability of the OM&M data is necessary to assess residual contaminant concentrations and to allow U.S. EPA to determine whether future monitoring of brook biota monitoring will be necessary to document the validity of the ecological risk assumptions made and demonstrate the protectiveness of the remedy.

Technical Assessment Summary

Cleanup levels for the brook and floodplain were based on a risk assessment that considered possible short and long-term exposures in the residential and industrial areas of the brook. From the cleanup levels, CRGs were developed that statistically determined the necessary amount of excavation required to achieve cleanup levels within a particular exposure area. Since the excavation cut lines were based on the CRGs, the cleanup that was performed in OU1/OU4 resulted in a remedy that is protective of human health and the environment. The commencement of the collection of OM&M monitoring data (beginning in 2004) will allow U.S. EPA to more fully evaluate the performance of the remedy.

VIII. Issues

Installation of Monitoring Wells / Commencement of OM&M Sampling

Since the OM&M Plan and the OM&M QAPP were approved in the spring of 2004, work can move forward on the monitoring well installation at the landfill and the OM&M sampling at the landfill and in the brook. The fact that this is an action item does not mean that this is a project deficiency. The five-year review cycle for Fields Brook was based on the initiation of an early source control cleanup. Therefore, the five-year review is being performed before the project has moved into the operation and maintenance phase.

Possible Need for Biota Sampling within Brook / Addition of Surface Water Monitoring

At this time, it is not known whether biota monitoring will be necessary in the brook to document the protectiveness of the remedy. The 1997 Focused Ecological Risk Assessment does not provide sufficient information to assess whether the sediment cleanup that was implemented at the site is fully protective of ecological receptors. However, without OM&M data to gauge the residual levels of contamination in the brook, U.S. EPA cannot determine whether biota monitoring is necessary. Therefore, U.S. EPA will evaluate the sediment and floodplain soil data that is to be collected as part of OM&M and will reassess the ecological risks at the site. The OM&M Plan should be supplemented to include surface water monitoring, so that water quality can be assessed. Based on the review of OM&M data, U.S. EPA may require the preparation of and implementation of a Biota Sampling Plan if, at any time during this process, it determines that the data indicates potential unacceptable ecological risks.

RMI Extrusion

The RMI Extrusion facility is located immediately adjacent to Fields Brook. The RMI Extrusion facility is privately owned (by RMI, Inc.) and is undergoing decommissioning under the oversight of the U.S. DOE and the ODH/BRP. The U.S. DOE is currently evaluating possible changes in the cleanup standards at the site. These changes could include increases in allowable concentrations of uranium in soil and allowable technetium-99 and organic solvents in groundwater. While U.S. EPA is not involved in the on-site cleanup, U.S. EPA has expressed concern to U.S. DOE (See Attachment 4) that potential off-site impacts need to be fully evaluated prior to any decision that would lessen cleanup standards.

State Road Bridge

The small State Road bridge over Fields Brook will eventually require maintenance or replacement. Since it was not possible to excavate immediately adjacent to the foundation of the bridge due to engineering concerns about the integrity of the structure, there is a possibility that DNAPL may be present along the base of the foundation. When future work at the structure is undertaken, the Fields Brook PRP group has committed to having the necessary consultants present to screen for DNAPL to ensure the health and safety of construction workers and has prepared a

work plan to guide their participation and responsibilities on such a project. Should DNAPL be found, the Fields Brook PRP group will step in and take the appropriate actions to remove contaminated material and ensure a safe work environment. The Fields Brook Settling Defendants need to transmit the work plan to Ashtabula County to ensure that the county is aware of the steps that should be taken to involve the Fields Brook PRP group.

Institutional Controls

When SoilPure, the original thermal treatment contractor, left the site, a subcontractor working under SoilPure claimed not to have been payed for work performed. This subcontractor placed a lien on the RMI Sodium property (the location of the Fields Brook landfill) and pursued the Fields Brook PRPs in court for payment. The court case has been resolved, and the lien has now been taken off the site. The Fields Brook PRPs are preparing to place the institutional controls on the site to address land use and groundwater consumption restrictions.

Although DNAPL-impacted soil and sediment was excavated to allow attainment of cleanup levels for volatile and semi-volatile organic compounds, there are areas where residual organic contamination is present where institutional controls should be in place to control access. The 2001 ESD to address DNAPL-Impacted Soils and Sediment required that deed restrictions be put in place along the floodplain to document the location, depth and type of residual contamination and to restrict future use of the areas as required in the 1997 Floodplain/Wetland ROD. The PRPs have notified U.S. EPA that they are working on implementing the deed restrictions, but they have not yet been put in place.

Detrex

Detrex has had difficulty meeting its NPDES requirements for its discharge to Fields Brook. Only once has the violation been due to contaminants that are directly attributable to the DNAPL, residuals of which are found in the aqueous phase that is sent to Detrex's on-site treatment system. U.S. EPA Superfund Division has provided written notification to Detrex that it must comply with their NPDES requirements or U.S. EPA may determine that their system is not performing properly and require the performance of additional remedial action measures. While recent discharges are not directly attributable to their treatment of water from the DNAPL extraction system, unacceptable discharges into Fields Brook are a concern for the long-term health of the brook.

Issue	Affects Current Protectiveness (Y / N)	Affects Future Protectiveness (Y / N)
Installation of Monitoring Wells / Commencement of OM&M Sampling.	**N**	**Y**
Possible Need for Biota Sampling within Brook / Addition of Surface Water Monitoring to OM&M Plan	**N**	**Y**
Coordination with DOE on Possible Changes in RMI Extrusion Cleanup Levels	**N**	**Y**
Forward State Road Bridge Work Plan to Ashtabula County	**N**	**Y**
Installation of Institutional Controls at Landfill Site	**N**	**Y**
Installation of Institutional Controls in Floodplain to address residual organic contamination from historical DNAPL presence.	**N**	**Y**
Detrex NPDES Violations - U.S. EPA WAM will require Detrex to be cc Region 5 Superfund Division on its monthly NPDES reporting.	**N**	**Y**

IX. Recommendations and Follow-up Actions

Monitoring wells should be installed in the early summer of 2004 so that chemical monitoring around the landfill can commence. OM&M sampling in the brook should be performed in the summer of 2004 so that the recovery of the brook can be evaluated.

The current OM&M Plan should be supplemented with a Sampling and Analysis Plan for the collection and analysis of surface water. This is necessary to ensure that U.S. EPA's assumptions regarding the ecological protectiveness of the remedy have proved valid. Based on the results of the OM&M sediment, floodplain soil and surface water data, U.S. EPA will make a determination whether future biota monitoring is necessary to verify the protectiveness of the cleanup for ecological receptors.

U.S. EPA should remain in close contact with the U.S. DOE and review and comment on potential changes to the cleanup at RMI Extrusion with regard to possible off-site impacts to Fields Brook.

U.S. EPA should confirm that institutional controls have been placed on the property housing the Fields Brook landfill and in floodplain areas where residual organic contamination is present due to historical proximity to now-excavated DNAPL-impacted soils.

U.S. EPA Superfund Division should maintain contact with the Region 5 Water Division and Ohio EPA to ensure that Superfund is aware of Detrex NPDES violations. This is important for the evaluation of the Detrex operable unit remedy and for monitoring the long-term health of the brook and floodplain. U.S. EPA will require Detrex to cc Region 5 Superfund Division on its monthly NPDES monitoring reports.

Issue	Responsible Party	Required Date for Resolution of Action Item
Installation of Monitoring Wells / Commencement of OM&M Sampling.	Settling Defendants under the RD/RA Consent Decree	July 30, 2004
Possible Need for Biota Sampling within Brook / Addition of Surface Water Monitoring to OM&M Plan	Settling Defendants under the RD/RA Consent Decree	Draft Sampling and Analysis Plan for Surface Water to U.S. EPA by July 30, 2004
Coordination with DOE on Possible Changes in RMI Extrusion Cleanup Levels	U.S. EPA WAM	No specific date. Will be a long-term action item - maintain monthly contact with DOE to ensure U.S. EPA is aware of status changes.
Forward State Road Bridge Work Plan to Ashtabula County	Settling Defendants	July 30, 2004
Installation of Institutional Controls at Landfill Site	Settling Defendants	July 30, 2004
Installation of Institutional Controls in Floodplain to address residual organic contamination from historical DNAPL presence.	Settling Defendants	July 30, 2004

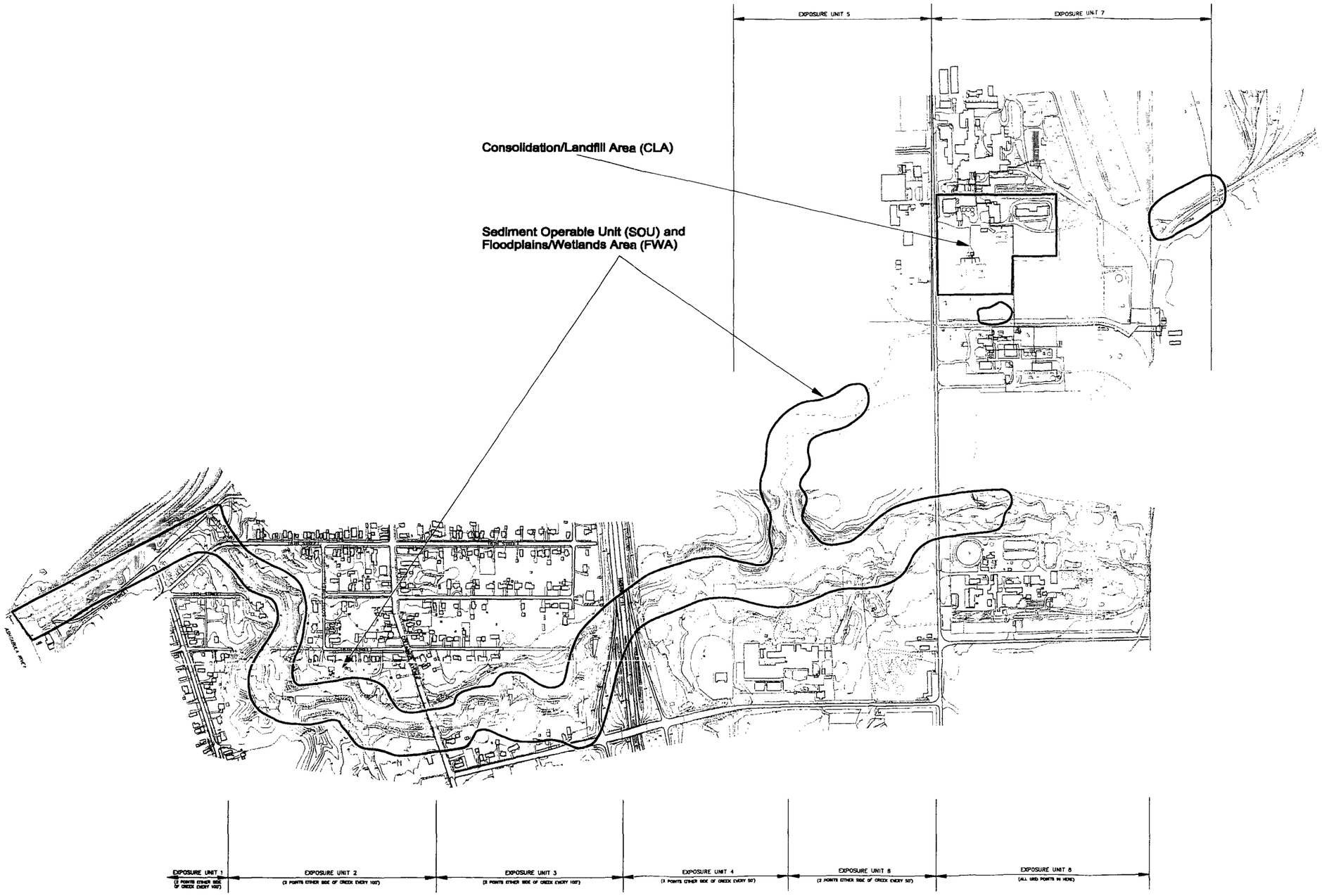
Issue	Responsible Party	Required Date for Resolution of Action Item
Detrex NPDES Violations - U.S. EPA WAM will require Detrex to be cc Region 5 Superfund Division on its monthly NPDES reporting.	U.S. EPA WAM	June 30, 2004

X. Protectiveness Statement

As noted in the introduction to this review, the five-year review assessments for the six Fields Brook source control operable units are presented in separate sections of this document. This was done to increase the readability of the five-year review document. Each source control operable unit is independent and has its own history and issues. In terms of protectiveness, however, the five-year review for the Fields Brook Superfund Site has determined that the remedial actions implemented across the entire site, including the brook and source control cleanups, are protective of human health and the environment. OM&M monitoring of the brook sediment, floodplain soils, and surface water are necessary to verify that the remaining levels of contamination in the brook are acceptable and to determine the need for any future biota monitoring.

XI. Next Review

The next five-year review for Fields Brook Superfund Site is required by June 2009, five years from the date of this review. However, U.S. EPA may elect to perform the review prior to this time if monitoring data raises questions or concerns about the protectiveness or long-term performance of the remedy.



NO.	DATE	REVISIONS	BY	CHK

DRAWN: LDZ	PROJECT NO: 49484,38.02	Harding Lawson Associates Engineering and Environmental Services 707 Seventeenth Street Suite 2400 Denver, Colorado 80202 (303) 292-5365	FIELDS BROOK SUPERFUND SITE ASHTABULA, OHIO
ENGINEER:	SCALE: 1"=800'		
CHECKED:	APPROVED:		
DATE:	DATE:		

Figure Brook-1

DRAWING NO: X / X / X

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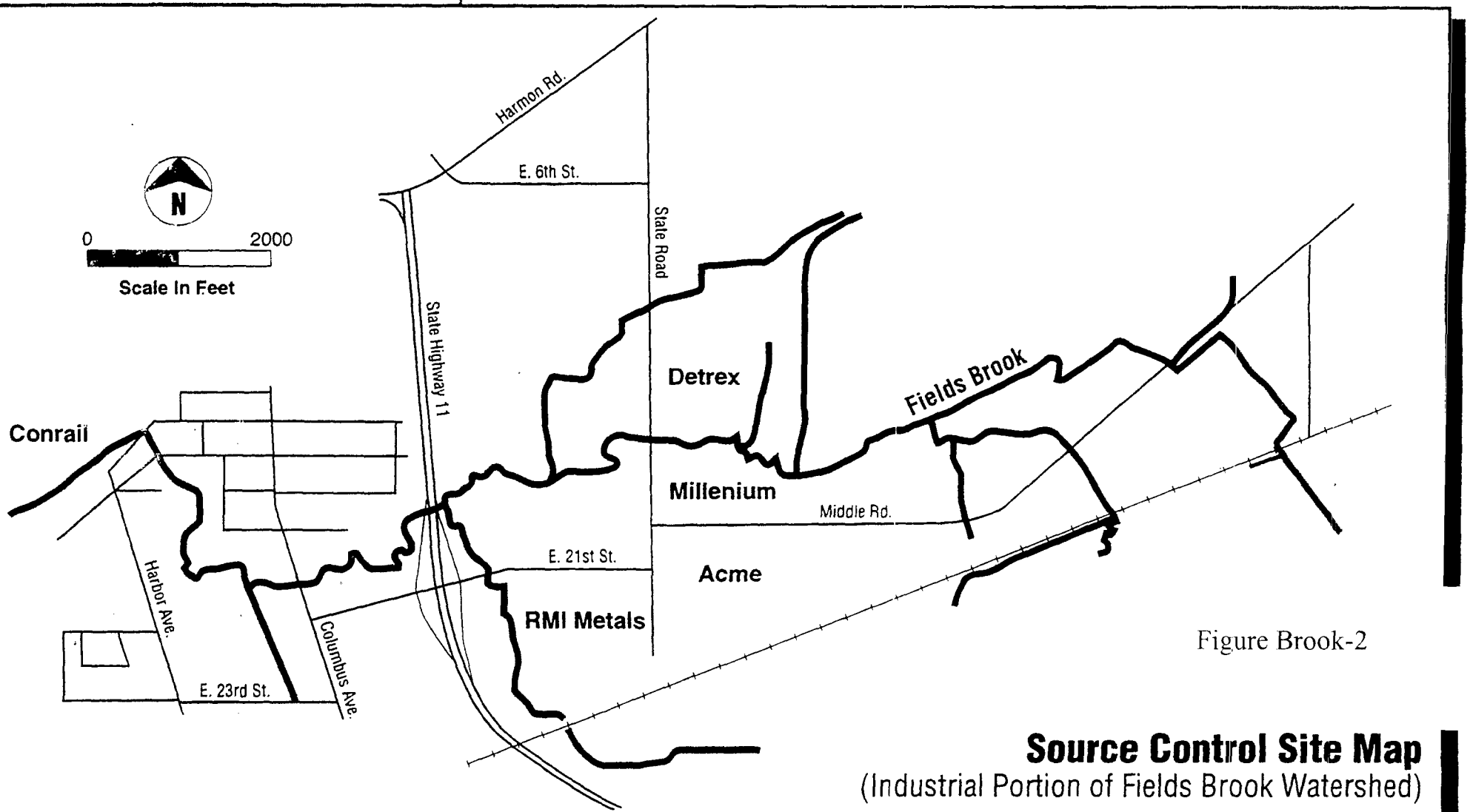

Figure Brook-2

Source Control Site Map
(Industrial Portion of Fields Brook Watershed)

PROJECT SCHEDULE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO

ID	Task Name	Duration	Start	Finish
1	HLA Mobilization	27 days	4/28/00	5/24/00
2	Landfill Excavation	56 days	5/25/00	7/19/00
3	Liner Installation	49 days	7/20/00	9/6/00
4	Setup, Excavation, and Backfilling of EU 1	76 days	6/22/01	9/5/01
5	Setup, Excavation, and Backfilling of EU 2	99 days	5/30/01	9/5/01
6	Setup, Excavation, and Backfilling of EU 3	54 days	5/30/01	7/22/01
7	Setup, Excavation, and Backfilling of EU 4	44 days	5/7/01	6/19/01
8	Setup, Excavation, and Backfilling of EU 5	7 days	10/19/00	10/25/00
9	Setup, Excavation, and Backfilling of EU 6	596 days	5/7/01	12/23/02
10	Setup, Excavation, and Backfilling of EU 7	13 days	8/22/00	9/3/00
11	Setup, Excavation, and Backfilling of EU 8	38 days	9/9/00	10/16/00
12	Encounter DNAPL - Shutdown	203 days	10/16/00	5/6/01
13	Continued Excavation and Backfilling of EU 8	509 days	5/7/01	9/27/02
14	DNAPL Investigation	167 days	10/16/00	3/31/01
15	Sevenson Mobilization	31 days	4/6/01	5/6/01
16	Landfill Capping	120 days	8/17/01	12/14/01
17	Thermal Treatment - Soil Pure - Mobilization	78 days	8/2/01	10/18/01
18	Thermal Treatment - Soil Pure - Operation	60 days	10/19/01	12/17/01
19	Thermal Treatment - Soil Pure - Demobilization	15 days	12/18/01	1/1/02
20	Thermal Treatment - ESMI - Mobilization	68 days	4/10/02	6/16/02
21	Thermal Treatment - ESMI - Operation	187 days	6/17/02	12/20/02
22	Thermal Treatment - ESMI - Performance Demonstration	3 days	10/8/02	10/10/02
23	Thermal Treatment - ESMI - Demobilization	70 days	12/21/02	2/28/03
24	Restoration Planting	182 days	10/1/02	3/31/03
25	Demobilization (Sevenson)	23 days	12/1/02	12/23/02
26	Excavation	847 days	8/22/00	12/16/02

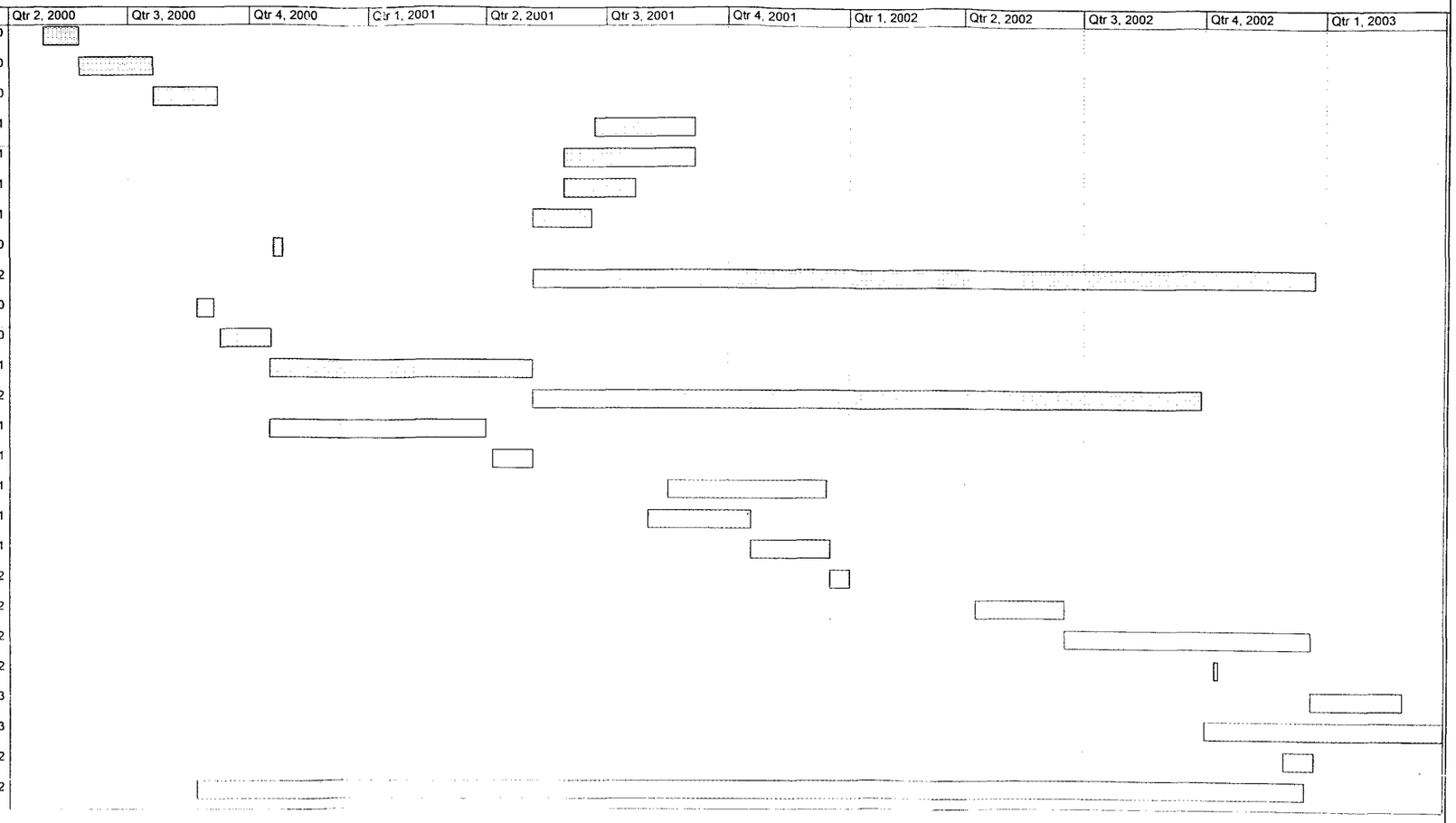

Figure Brook-3

Project: 11676 - Chronology.mpp
Date: 10/30/03

Table Brook-1

SUMMARY OF MATERIAL EXCAVATION QUANTITIES

FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO

Item	*Material Quantity Excavated (cubic yards)*		*(tons)*	
Exposure Unit 1				
SOU	2,383		3,336	(1)
FWA	144		202	(1)
Exposure Unit 2				
SOU	3,234		4,528	(1)
FWA	9,055		12,677	(1)
Exposure Unit 3				
SOU	1,369		1,917	(1)
FWA	2,995		4,193	(1)
Exposure Unit 4				
SOU	1,283		1,796	(1)
FWA	2,157		3,020	(1)
Exposure Unit 6				
SOU	2,115		2,961	(1)
FWA	2,683		3,756	(1)
DNAPL Impacted Material	12,580	(2)	17,612	
Exposure Unit 8				
SOU	242		339	(1)
FWA	3,698		5,177	(1)
DNAPL Impacted Material	7,840	(2)	10,976	
Exposure Unit 5				
SOU	216		302	(1)
Exposure Unit 7				
SOU	1,100		1,540	(1)
Subtotal - Off-Site Thermal Treatment	1,436		2,010	
Subtotal - On-Site Thermal Treatment	20,420		28,588	
Subtotal - On-Site Landfill	31,239		43,734	
Total Material Excavated from the Site	**53,094**	**(3)**	**74,331**	(1)

Notes:

(1) Tonnage calculated based on an average density of 1.4 tons per cubic yard.

(2) Tonnage, weighed on on-Site scale, converted to cubic yards basec on an average density of 1.4 tons per cubic yard.

(3) Total quantity includes 2,010 tons of PCB impacted material from the FWA and SOU which was transported off-Site for incineration.

FWA - Floodplains/Wetlands Area (volumes include radium impacted material).

SOU - Sediment Operable Unit

DNAPL - Dense Non-Aqueous Phase Liquid

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

FILE COPY

REPLY TO THE ATTENTION OF
SR-6J

March 16, 2004

Mr. Robert Warther
Manager, Ohio Field Office
U.S. Department of Energy
175 Tri-County Parkway
Springdale, OH 45246-3222

RE: Possible Environmental Impacts from Potential Changes in License Conditions at the RMI Extrusion Site in Ashtabula, Ohio

Dear Mr. Warther:

The U.S. Environmental Protection Agency (U.S. EPA) is the lead agency at the Fields Brook Superfund Site in Ashtabula, Ohio. After twenty years of investigation, planning and coordination, the cleanup of the Fields Brook Site was recently completed. I am currently preparing a five-year review of the Fields Brook Site, and one of the issues being assessed in this review is possible recontamination of the brook sediments and floodplain soils from sources within the industrial area of Ashtabula.

U.S. EPA is concerned that the U.S. Department of Energy (DOE) is contemplating a change to the cleanup standards at the RMI Extrusion Site in Ashtabula and that such a change might negatively impact Fields Brook. In the past, the Nuclear Regulatory Commission prepared an environmental assessment to ensure the acceptability of the project scope under the license and Decommissioning Plan. DOE has not yet prepared an environmental assessment for its anticipated changes to the cleanup scope and the decommissioning plan at RMI Extrusion. While U.S. EPA is evaluating information in the draft Risk-Based End State report (including the RESRAD calculations), to our knowledge DOE has not performed a full evaluation of potential off-site impacts. This would include, but not be limited to, models of groundwater movement off-site, surface water run-off, and erosion of contaminated soils into Fields Brook, which ultimately flows through residential areas.

DOE, as the lead Agency on the proposed action to modify the Decommissioning Plan, has the responsibility to provide U.S. EPA and the public with the information necessary to show that proposed changes at the RMI Extrusion Site will not have any negative off-site impacts.

At this time, U.S. EPA does not have the information necessary to fully assess impacts to Fields Brook from changes in the cleanup standards at RMI Extrusion. U.S. EPA therefore requests that DOE undertake the environmental analysis process under the National Environmental Policy

Act (NEPA), DOE Implementating Procedures (10 CFR 1021), for any modifications to site cleanup standards. U.S. EPA expects the NEPA process to provide the information necessary to evaluate the acceptability of long-term releases to Fields Brook. Absent such information, any negative impact to Fields Brook in this area would be assumed to be the result to changes to cleanup levels at the RMI Extrusion Site and U.S. EPA would look to DOE and/or RMI to pay for any remediation necessary to address the negative impacts.

If you have any questions, please feel free to contact me at (312) 353-6564 or Peter Felitti with the Office of Regional Counsel, at (312) 886-5114. Thank you for your attention to this matter.

Sincerely,

Terese A. Van Donsel
Remedial Project Manager, Superfund Division

cc: W. Carney, Superfund
T. Short, Superfund
G. Schafer, Superfund
P. Felitti, Office of Regional Counsel
S. Williams, Ohio EPA
G. Zikmanis, Ohio EPA
C. McCracken, ODH/BRP
T. Williams, DOE-Ashtabula
C. Bergstrom, DOE-Office of NEPA Policy and Compliance
R. Mason, RMI

3075-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
April 2003

Date: May 6, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of April 2003. Also included is a copy of the monthly Inspection and Maintenance. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).

- On April 9, the OM&M Project Manager visited the Site to perform the first monthly site inspection with the Site Technician. The Inspection and Maintenance Log was completed and is attached. The Landfill and Exposure Unit (EU) 8 and EU6 were still under control of Sevenson Environmental Services, Inc. (Sevenson) at the time of inspection. Items yet to be completed by Sevenson at the time of inspection were:

  - A final cleanup of the Landfill, and
  - Exposure Unit (EU) 8, and part of EU 6 needed to be seeded.

  These items were completed by Sevenson during the week of April 22, 2003.

- The leak at the valve in the water line located near the Sevenson trailer was repaired.

- The Millennium fence access to EU8 was relocated to the north side of the gravel road.

Problems Encountered:

No problems were encountered during the month of April.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

- The following activities will be performed in May:

    1) The gate to the Landfill will be replaced.
    2) The Landfill will be seeded.
    3) The LDS and LCS riser elbows and caps will be replaced with long elbows and locking caps.
    4) The erosion coir log in EU4 will be secured.

- O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

- O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: R McVay & V Rule
Date/Time On Site: 8:45 AM ; 4-9-03
Weather: Wet, Windy 42°F
Signature: Valerie A Rule

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	OK			
b. Gate	Vandalism, collapse, functional inadequacy				
c. Locks	Inoperative, missing				
d. Signs	Vandalism, unreadable, collapse, missing				
2. Access Roads	Ruts Potholes Debris	NR	Debris around Landfill	Cleared	Week of 4/22/03
3. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	NR	Bare spots need seeding	Scheduled for May	
b. Slopes	Washouts, breakouts and sloughing				
c. Vegetation	Bushes/tree growth, bare spots				
d. Settlement	localized depressions, sloughing on slopes				
4. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	OK			
b. Concrete pad	Damage, Excessive weeds/growth				
5. Leachate Collection System					
a. Leachate	Level, silt build-up	NR	Need long ELs No place for locks	Scheduled for May	
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Leachate Detection System					
a. Leachate	Level, silt build-up	NR	Need long ELs No place for locks	Scheduled for May	
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
7. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock		N/A		
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

NR - Needs Repair
OK - Okay

Inspector Name: R McVoy & V Rule
Date/Time On Site: 8:45 AM; 4-9-03
Weather: Wet, Windy, 42°F
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
8. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	NR	Sediment + debris needs to be cleared	Cleared	Week of 4/22/03
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	OK			
9. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	NR	Erosion sock needs to be secured in EU 4 near SD05+SS13	Removed plank from brook Scheduled for May	

Leachate Removal: None

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments: Water line break - minor leak at valve - repaired in April

cc: OM&M Project Manager

NR - Needs Repair
OK - Okay

719-07

O & M, Inc.
Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
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MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
May 2003

Date: June 3, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. AR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of May 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).

- The monthly inspection of the landfill was performed on May 16 and 26, 2003. The following items were noted:

    - The landfill toe drains have been cleared by Sevenson

    - The landfill entrance gate needs replacement.

- The monthly inspection of the brook and floodplain was performed on May 29th, 2003. The following items were noted:

    - New grass was noted in EU6 and EU8.

    - The erosion coir log in EU4 still requires securing. The high brook water levels have prevented this activity from being completed.

    - The LDS and LCS riser elbows and caps require replacement with long elbows and locking caps to enable leachate monitoring.

- During the monthl of May, access to the Site was provided to the following persons:

DATE	NAME / COMPANY	PURPOSE
5/5/03	CEI Company	Read Electric Meter
5/6/03	CEI Company	Disconnect Overhead Loop
5/7/03	O&P Oil	Remove fuel skid
5/28/03	ESMI	Working on Incinerator
5/30/03	Microbac	Sampling Sewage Treatment Plant

- Sevenson continues to complete contract activities at the site, including:
  - Cleaning the perimeter trench around the Landfill,
  - Installing silt fence in EU8, and
  - Re-seeding areas where grass has not taken root.

Problems Encountered:

No problems were encountered during the month of May.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in June:

1) The gate to the Landfill will be replaced.
2) The Landfill will be seeded after Sevenson has completed reseeding areas under its contract.
3) The erosion coir log in EU4 will be secured. This was not performed in May due to high water levels in the Brook.
4) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.
5) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: RON McKay
Date/Time On Site: MAY 16, '20, 29
Weather: RAIN, RAIN, RAIN
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control		✓			
a. Fence	Vandalism, collapse, holes	DAM.	CONTACTED FENCE CO. WILL REPAIR BY 6/5		
b. Gate	Vandalism, collapse, functional inadequacy	NEW	ALL NEW LOCKS		
c. Locks	Inoperative, missing	N/A			
d. Signs	Vandalism, unreadable, collapse, missing				
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity			TOE DRAINS CLEARED		
a. Surface Features	Animal burrows, washouts, cracks	✓			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System		✓	CLEAN A LITTLE		
a. Leachate	Level, silt build-up	✓	HITCH PINS FOR LOCKS		
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
5. Leachate Detection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Groundwater Monitoring Wells			N/A		
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: RON McVOY
Date/Time On Site: MAY 16, 26, 29
Weather: RAIN, RAIN, RAIN
Signature:

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth				
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway				
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity		WALKED - ALL OK GRASS STARTING AT SD 20 AND EAST. CANT REPAIR SOCK AT SD05 DUE TO RUSHING WATER.		

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

3075-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
June 2003

Date: July 3, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of June 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- The landfill entrance gate was repaired during the week of June 2, 2003.
- The landfill area was mowed on June 16, 2003.
- The monthly inspection was performed on June 21, 2003. The following items were noted:
    - Groundhog burrows were noted on the landfill. The Site Manager is currently addressing catching the groundhogs.
    - The erosion coir log in EU4 still requires securing. The high brook water levels have prevented this activity from being completed.
- During the month of June, access to the Site was provided to the following persons:

DATE	NAME / COMPANY	PURPOSE
6/2 to 6/4/03	Thomas Fence Co.	Replace post and gate at landfill entrance
6/6/03	CEI Company	Meter Reading
6/7/03	Microbac	Sampling Sewage Treatment Plant
6/17 and 6/19/03	Sevenson Environmental	Maintenance

Problems Encountered:

No problems were encountered during the month of June.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in July:

1) The erosion coir log in EU4 will be secured. This was not performed earlier due to high water levels in the Brook.
2) The groundhogs will be removed from the Site.
3) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.
4) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: MCVoy
Date/Time On Site: June 21, 2003
Weather: P.C. Cloudy - Clear
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth				
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway				
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓ ✓	STILL NEED TO Repair SOCK AT SD05. NO RAIN. Will DO IN JULY.		

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

Inspector Name: RON MCVOY
Date/Time On Site: JUNE 21, 2003
Weather: PT CLOUDY - CLEAR
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓	REPAIRED GATE - REPLACED POST		6/4 & 5
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing		SHOULD PURCHASE NEW ONES		
2. Access Roads					
	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, [illegible]		Need to TRAP 2-GROUND HOGS		DIGGING HOLE
b. Slopes	Washouts, breakouts and sloughing	✓			
* c. Vegetation	Bushes/tree growth, bare spots	✓	MOWED LAND FILL		
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock		N/A		
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

* Mowed landfill.

3075-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
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MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
July 2003

Date: August 5, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of July 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- O & M, Inc. continues to revise the OM&M Quality Assurance Project Plan in response to EPA requirements.
- An erosion coir log located in EU4 was secured.
- One groundhog was caught and removed from the landfill area.
- The monthly inspection was performed on July 11, 2003. The following items were noted:
    - Brush along fenceline needs to be cleared.
- During the month of July, access to the Site was provided to the following persons:

DATE	NAME / COMPANY	PURPOSE
7/2/03	Rick Mason RMI ES	Fence Inspection
7/30/03	Karen Eglinton Earthline Technologies	Fence Inspection
7/31/03	Microbac	Sampling

Problems Encountered:

No problems were encountered during the month of July.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in August:

1) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.
2) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: Ron McVoy
Date/Time On Site: July 11, 2003
Weather: Clear HOT
Signature: Ronald McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing		NEED TO REPLACE		
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks		GOT 1 GROUND HOG -		
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓	AROUND FENCES NEEDS WORK		
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock		N/A		
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: Ron McVoy
Date/Time On Site: July 11, 2003
Weather: Clear - HOT
Signature: Ronald McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System					
a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection					
a. FWA	Bare spots, wash outs	✓	Required SOCK - Will see if STAKES HOLD		
b. Brook	Erosion, wash outs, sloughing, silting, rip rap integrity				

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

O & M, Inc.

Valerie Rule, P.E.

AUTHORIZATION TO ENTER LANDFILL

Company Name: Earthline Technologies - Karen Eglinton

Date: 7/30/03

Reason: fence inspection

Time In: 9:50 am
Time Out: 11:30 Am

Gate Secured By: Karen C Eglinton

Comments:

File: AUTHreport

O & M, Inc.

Valerie Rule, P.E.

AUTHORIZATION TO ENTER LANDFILL

Company Name: RMIES

Date: ~~6/~~ 7/2/03

Reason: Inspection of fence for RMI - Rick Mason

Time In: 10:10 Am
Time Out: 10:35 Am

Gate Secured By: Karen C Eglenton

Comments:

File: AUTHreport

O & M, Inc.

Valerie Rule, P.E.

AUTHORIZATION TO ENTER LANDFILL

Company Name: MICHIBAC

Date: 7/31/07

Reason: SAMPLING

Time In: 12:00

Time Out: 12:20

Gate Secured By: MARK STABLEIN

Comments:

719-07

O & M, Inc.
Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
August 2003

Date: September 8, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of August 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- O & M, Inc. continues to revise the OM&M Quality Assurance Project Plan in response to EPA requirements.
- The monthly inspection was performed on August 23rd and 30th , 2003. The following items were noted:
    - Brush along fenceline needs to be cleared.
- During the month of August, access to the Site was provided to the following persons:

DATE	NAME / COMPANY	PURPOSE
8/19/03	Karen Eglinton Earthline Technologies	Fence Inspection
8/26/03	Mark Stablein Microbac	Sampling

Problems Encountered:

No problems were encountered during the month of August.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in September, 2003:

1) The grass on the landfill will be cut in the month of September
2) The brush and debris along the fenceline will be cleared during the months of September and October, 2003.
3) The Quality Assurance Project Plan will be submitted for approval on September 5th.
4) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.
5) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: Ron MacVoy
Date/Time On Site: 8-23 @ 30
Weather: Clear - No Rain
Signature: Ronald MacVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓	NEED TO REPLACE	WORDING ?	
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks				
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock		N/A		
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: Ron McVoy
Date/Time On Site: 8-23-30
Weather: Clear - No Rain
Signature: Ronald McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓			

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

3075.07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
September 2003

Date: October 9, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of September 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- O & M, Inc. submitted the OM&M Quality Assurance Project Plan on September 5, 2003.
- The monthly inspection was performed on September 23rd and 24th, 2003.
- The Site Technician began clearing the brush along the fence line in September.
- The grass on the landfill and outside of the fence along the road was cut on September 30, 2003.
- During the month of September, access to the Site was provided to the following persons:

DATE	NAME / COMPANY	PURPOSE
9/16/03	Karen Eglinton Earthline Technologies	Fence Inspection
9/10/03	Phil Theriault ESMI	Plant Inspection

Problems Encountered:

Groundhogs have been sited near the middle gas vent on top of the landfill. The Site Technician has used smoke bombs to evacuate the holes before filling them in the first week of October.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in October, 2003:

1) Clearing of the brush and debris along the fenceline will be continued through the month of October, 2003.

2) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

3) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: McVoy
Date/Time On Site: 9-23-24
Weather: Cold - Wet - RAIN
Signature: Richard McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓	GRASS IS HIGH ✓ OK		

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

Inspector Name: McVoy
Date/Time On Site: 9-23 & 24
Weather: Cold - WET - RAIN
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing		HAVE ORDERED SIGNS		
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris		NEED SOME CLEANING		
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks		TRYING SMOKE BOMBS		
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up	✓	VISUALLY OK		
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock		N A		
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

O & M, Inc.

Valerie Rule, P.E.

AUTHORIZATION TO ENTER LANDFILL

Company Name: ESMI of New York

Date: 9/10/03

Reason: View Plant

Time In: 9:40

Time Out: 10:35

Gate Secured By: Phil Leonard

Comments:

File: AUTHreport

O & M, Inc.

Valerie Rule, P.E.

AUTHORIZATION TO ENTER LANDFILL

Company Name: Earthline

Date: 9/16/03

Reason: Inspection

Time In: 2 PM

Time Out: 3:30 PM

Gate Secured By: Karen Eglinton

Comments:

File: AUTHreport

O & M, Inc.

Environmental Operations and Maintenance Management

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MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
October 2003

Date: November 6, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of October 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- From October 6 through 24, ESMI dismantled the soil treatment equipment and removed it from the landfill area.
- On October 27, the RMI field inside the fence was bush-hogged.
- On October 31, Earthline Technologies over-seeded the landfill bank areas.
- The monthly inspection was performed on October 25th and 26th, 2003.
- The Site Technician continues to clear the brush along the fence line.
- Access also was provided for the following persons during the month of October:

DATE	NAME / COMPANY	PURPOSE
10/9/03	Karen Eglinton Earthline Technologies	Fence Inspection
10/28/03 10/30/03	Mark Stablein Microbac	Sampling

Problems Encountered:

No problems were encountered during the month of October.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in October, 2003:

1) Clearing of the brush and debris along the fenceline will be continue through the month of November, 2003.

2) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

3) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: MCVOY, RON
Date/Time On Site: OCT. 25, 26
Weather: FAIR - CLEAR THEN RAIN
Signature: Ronald McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing				
2. Access Roads	Ruts	✓			
	Potholes	✓	SOME DEVELOPING		
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	✓			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓	CLEANED		
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓	VISUALLY OK		
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: Ron McVoy
Date/Time On Site: Oct 25, 26
Weather: Rainy
Signature: Ronald McVoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓			

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

5075-01

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
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Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
November 2003

Date: December 5, 2003

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of November 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- Throughout the month of November, ESMI of NY continued progress on removing the soil treatment equipment from the landfill area. Final cleanup of their area was completed on November 18, 2003.
- Throughout the month of November, the Site Technician cleared the brush and undergrowth along the property fenceline.
- The monthly inspection was performed on November 22nd , 2003.
- Access also was provided for the following persons during the month of November:

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
11/3/03 11/4/03 11/10/03 11/12/03	Earthline Technologies	Clearing brush along RMI fenceline
11/4/03	Karen Eglinton Earthline Technologies	RMI Fence Inspection

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
11/11/03	Rick Mason Dennis Wade RMI Titanium	RMI Landfill Inspection
11/20/03	Karen Eglinton Dennis Wade Al Lambacher Earthline Technologies	RMI Landfill Inspection
11/24/03	Mark Stablein Microbac	Sampling

Problems Encountered:

No problems were encountered during the month of November.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in December, 2003:

1) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

2) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: McVoy, Rossi
Date/Time On Site: Nov 22, 23
Weather: Rain Thunderstorm
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓			
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris		Need some clean up		
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	✓			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓	Clear		
b. Concrete pad	Damage, Excessive weeds/growth				
4. Leachate Collection System		✓			
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System		✓			
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: Metz, Ron
Date/Time On Site: Nov 22, 23
Weather: Rain, Heavy Clouds
Signature:

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓			

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

3015-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
December 2003

Date: January 23, 2004

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of December 2003. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- The monthly inspection was performed on December 25th and 26th, 2003.
- Access also was provided for the following persons during the month of December:

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
12/3/03	Karen Eglinton Earthline Technologies	RMI Fence Inspection
12/4/03	Time Marzee CEI	Read Meters
12/9/03	Mark Stablein Microbac	Sampling
12/22/03	Karen Eglinton Earthline Technologies	RMI Landfill Inspection

Problems Encountered:

No problems were encountered during the month of December.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in January, 2004:

1) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

2) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: R. McVoy
Date/Time On Site: DEC. 25 & 26
Weather: COLD - IT SNOWS
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓			
2. Access Roads	Ruts	✓			
	Potholes	✓	Big pothole in [illegible]	+	
	Debris				
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	✓			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓	Hot August		
b. Concrete pad	Damage, Excessive weeds/growth				
4. Leachate Collection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
5. Leachate Detection System					
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

I got down the pipe 35' and no signs of water or readings. I now attach a fiberglass rod with tape to go down the pipe and tie the water indicator to it

Inspector Name: R. McVoy
Date/Time On Site: Dec. 25 & 26
Weather: Cold - Lt. Snow
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System					
a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓			
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection					
a. FWA	Bare spots, wash outs	✓			
b. Brook	Erosion, wash outs, sloughing, silting, rip rap integrity	✓			

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

3015-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
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MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
January 2004

Date: February 9, 2004

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of January 2004. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- The monthly inspection was performed on January 25, 2004. Leachate was detected in the leachate collection system. The leachate will be sampled for characterization, which will determine the disposal facility to be used.
- Access was provided for the following persons during the month of January:

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
1/6/04	Time Marzec CEI	Read Meters
1/21/04	RMIES	RMI Fence Inspection
1/27/04	Mark Stablein Microbac	Sampling

Problems Encountered:

No problems were encountered during the month of January.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in February, 2004:

1) O & M, Inc. will collect a sample of the leachate that has been detected in the leachate collection system. The analytical results will be provided upon receipt.

2) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

3) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: MC Vay
Date/Time On Site: 1-25-04
Weather: ICE, SNOW
Signature: Donald McVay

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓			
2. Access Roads					
	Ruts	✓			
	Potholes	✓			
	Debris	✓	Needs clean up		
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	None			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓	Not plugged		
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up	?	Snow, ice		
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓	MWO4 Good		
5. Leachate Detection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock				
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Inspector Name: MCVoy
Date/Time On Site: 1-25-04
Weather: ICE, SNOW
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth				
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway				
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity		COULD NOT WALK THIS DUE TO ICE. USED BINOCULARS FROM EACH ROAD AND ACCESS POINT. EVERYTHING LOOKED GOOD.		

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

3075-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
February 2004

Date: March 2, 2004

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of February 2004. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).

- The monthly inspection was performed on February 21 and 22, 2004. A copy of the Inspection and Maintenance Log is attached.

- Leachate has been detected in the leachate collection system. The leachate was sampled for disposal parameters on February 10. Results are provided in the attached Table 1 and associated Form 1's. The disposal characterization includes TCLP VOCs and TCLP Semi-VOCs. Samples for standard VOC and SVOC characterization will be collected on the date that the leachate is removed. The parameter Lead also will be re-analyzed at this time. The leachate will be removed and disposed at an appropriately licensed facility, to be approved by the Project Coordinator.

- The Site Technician began removing more shrubs and debris from the fenceline.

- Access was provided for the following persons during the month of February:

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
2/4/04	Time Marzec CEI	Read Meters
2/10/04	Mark Stablein Microbac	Sampling
2/19/04	Karen Eglinton	Landfill Inspection

Problems Encountered:

The leak detection riser was found below the snow in a block of ice. A water level could not be measured due to the block of ice around the riser cap. If water has leaked into this system, it will be removed when the leachate is collected in March. The riser pipe will be extended to stay above storm water level.

Leachate Pumped:

None this reporting period.

Scheduled Activities:

The following activities are scheduled to be performed in March, 2004:

1) The leak detection riser will be extended to stay above stormwater level.

2) The leachate will be removed from the leachate collection system and taken to an appropriately licensed water treatment facility.

3) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

4) O & M, Inc. will continue to direct subcontractors as needed at the site.

Table 1
Fields Brook Landfill
Analytical Results - Sample from Leachate Collection System
Date Collected: 2/10/04

Depth to Leachate from top of riser: 15.80 feet
Form 1's from analyses are attached. Analyses performed and detected parameters are listed below.

Parameter	Method	Result	MCL
Corrosivity as pH		**6.68**	
TDS		**168 mg/L**	
pH		**6.45**	
TSS		**1.40 mg/L**	
TCLP VOCs	SW846 1311/8260B	none detected	
TCLP SVOCs	SW846 1311/8270C	none detected	
Barium	SW846 TCLP Metals	**86.7 ug/L**	2,000 ug/L
Lead	SW846 TCLP Metals	**22.5 ug/L N***	15 ug/L treatment technique
PCBs	SW846 8082	none detected	
TCLP Herbicides	SW846 8151A	none detected	
Radium-226	E903.1	< 0.616 pCi/L	5 pCi/L
Radium-228	E904.0	**1.46 pCi/L (estimated)**	
Total Uranium	KPA	< 0.198 ug/L	30 ug/L
Isotopic Thorium	HASL 300	**Th-230 0.381 pCi/L** Th-228 < 0.373 pCi/L Th-232 < 0.231 pCi/L	
Gross Alpha Gross Beta	9310/900	< 1.90 pCi/L < 1.69 pCi/L	15 pCi/L

N* See Form 1 for Lead

Inspector Name: Ron McCoy
Date/Time On Site: 2-21 & 22
Weather: Cold 33° - Snow - Ice
Signature: Ronald McCoy

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control			Started work on more clean up of shrubs & debris		
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓			
2. Access Roads					
	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	None			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓	Not plugged		
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System			MW04 Good		
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓	*		
5. Leachate Detection System			15.80'		
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
6. Groundwater Monitoring Wells		X			
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

* Found 2ND pipe - It was buried under a large layer of ice in ditch plus it was in the mud. It will extend the pipe above the level of grade this month of March.

Inspector Name: Ron McVoy
Date/Time On Site: 2-21 & 22
Weather: Cold 33° -- Snow - Ice
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth				
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, ripcap outlets disturbed, damage to spillway				
8. FWA / Brook (SOU) Inspection a. FWA b. Brook	Bare spots, wash outs Erosion, wash outs, sloughing, silting, rip rap integrity	✓ ✓	NO MAJOR WINTER DAMAGE		

Leachate Removal:

Date/time				
Volume removed				
Manifest No. (attach original)				
Transporter				
Disposal Facility				
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager

SW-846

I-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

FB-01-0204

Lab Name: CompuChem Contract:

Lab Code: Case No.: NRAS No.:

SDG No.: 2210

Matrix (soil/water): WATER Lab Sample ID: 221001

Date Received: 2/12/04 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Reactive Cyanide	125	U			2/17/04
Reactive Sulfide	250	U			2/17/04
Corrosivity as pH	6.68				2/16/04
Ignitability	>140				2/16/04
TDS	168				2/16/04
pH	6.45				2/12/04
TSS	1.40				2/16/04

Comments: Corrosivity and pH are reported in pH units, Ignitability is reported in Degrees F.

2

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: 2209

Matrix: (soil/water) WATER Lab Sample ID: 220901

Sample wt/vol: 5 (g/ml) ML Lab File ID: 220901B59

Level: (low/med) LOW Date Received: 02/12/04

% Moisture: not dec. _____ Date Analyzed: 02/18/04

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: 2209

Matrix: (soil/water) LEACHATE Lab Sample ID: 220901

Sample wt/vol: 100 (g/mL) ML Lab File ID: 220901A64

Level: (low/med) LOW Date Received: 02/12/04

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/17/04

Concentrated Extract Volume: 500(uL) Date Analyzed: 02/17/04

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	100	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Contract: 8082

Lab Code: COMPU Case No.: SAS No.: SDG No.: 2210

Matrix: (soil/water) WATER Lab Sample ID: 221001

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 02/12/04

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 02/13/04

Concentrated Extract Volume: 2500(uL) Date Analyzed: 02/13/04

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
12674-11-2	Aroclor-1016	0.93	U
11104-28-2	Aroclor-1221	1.3	U
11141-16-5	Aroclor-1232	0.93	U
53469-21-9	Aroclor-1242	0.63	U
12672-29-6	Aroclor-1248	0.63	U
11097-69-1	Aroclor-1254	0.63	U
11096-82-5	Aroclor-1260	0.93	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: 2209

Matrix: (soil/water) WATER Lab Sample ID: 220901

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 02/12/04

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:02/17/04

Concentrated Extract Volume: 5000(uL) Date Analyzed: 02/17/04

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.13	U
72-20-8	Endrin	0.50	U
76-44-8	Heptachlor	0.13	U
1024-57-3	Heptachlor Epoxide	0.13	U
72-43-5	Methoxychlor	1.3	U
8001-35-2	Toxaphene	25	U
12789-03-6	Technical Chlordane	0.80	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: COMPU Case No.: SAS No.: SDG No.: 2209

Matrix: (soil/water) WATER Lab Sample ID: 220901

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 02/12/04

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:02/17/04

Concentrated Extract Volume: 5000(ul) Date Analyzed: 02/17/04

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	25	U
93-72-1	silvex	5.0	U

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

FB-01-0204

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: 2209

Matrix (soil/water): TCLP Lab Sample ID: 220901

Level (low/med): LOW Date Received: 2/12/04

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	86.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.20	U		P
7440-47-3	Chromium	0.60	U		P
7439-92-1	Lead	22.5		N*	P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	2.0	U		P
7440-22-4	Silver	0.50	U		P

* explanation attached

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

000009

CompuChem
A Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

INORGANIC CASE SUMMARY NARRATIVE
SDG # 2209
PROTOCOL #SW-846

The indicated Sample Delivery Group (SDG) consisting of one (1) water sample was received into the laboratory management system (LIMS) on February 12, 2004 intact and in good condition with Chain of Custody in order. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The sample was analyzed for TCLP arsenic, barium, beryllium, cadmium, chromium, lead, mercury, selenium and silver using analytical methods delineated in SW-846 (Update III).

SAMPLE IDs:

The cover page contained in this package lists the client ID's and the associated CompuChem numbers which are part of this SDG.

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV, CCV), blanks (ICB, CCB) and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges. All field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike 24000 (metals) 24804 (mercury) (FB-01-0204S) was outside control limits for lead. The sample matrix spike duplicate, 24014 (metals) 24805 (mercury) (FB-01-0204SD) was outside control limits for lead. The reported concentration for this analyte is flagged with an "N" on all associated Form 1 and on Form 5a.

An "N" indicates a matrix-related interference in the sample preparation procedure &/or analysis for the flagged analyte. This is normally the consequence of a relatively high anionic content in the sample or (for some sediments) an inconsistent sample matrix relative to that analyte.

SW-846 control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more; in this case effected analytes are not flagged even if recoveries fall outside percentage recovery control limits.

Post-digestion spikes are mandatory for analytes demonstrating unsatisfactory matrix spike recoveries during ICP analysis (excluding silver). The results of such spikes are presented on Form 5b.

Satisfactory recovery of an analyte in a post-digestion spike of this type implies interference by the required preparation procedure or in the sample matrix itself. Lack of uniformity for an analyte in sediments will also result in satisfactory recovery of post-digestion spikes after failure in the related matrix spike.

Unsatisfactory recovery of post-digestion spikes of this type do not have bearing upon the aforementioned "N" flags, but may indicate interference during analysis &/or a solution matrix which is hostile to the analyte in question.

The sample matrix duplicate, 23999 (metals) 24803 (mercury) (FB-01-0204D) was outside control limits for lead. The form 1 and form 6 are flagged with a "*" to indicate duplicate results which are outside control limits.

A "*" indicates a non-homogeneous sample matrix in regard to the flagged analyte. This is normally the consequence of a relatively coarse texture or of a mixed-matrix in sediment samples.

SW-846 control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, 220901 (FB-01-0204L) was performed in accordance with SW-846 requirements for ICP analysis.

The adjusted sample concentrations were inside control limits for all requested analytes.

SW-846 control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Mary K. Powell
Data Reviewer II
February 25, 2004

Note: This report is paginated for reference and accountability.

GENERAL ENGINEERING LABORATORIES, LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : CompuChem Laboratories
Address : 501 Madison Ave.
Cary, North Carolina 27513

Report Date: February 26, 2004

Contact: Bill Scott
Project: **Fields Brook Radiochemistry**

Client Sample ID: FB-01-0204
Sample ID: 106966001
Matrix: Waste Water
Collect Date: 10-FEB-04 11:55
Receive Date: 12-FEB-04
Collector: Client

Project: CENC00104
Client ID: CENC002

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Th, Liquid												
Thorium-228	U	-0.0402	+/-0.190	0.373	1.00	pCi/L		AB2	02/17/04	1325	310029	1
Thorium-230		0.381	+/-0.236	0.212	1.00	pCi/L						
Thorium-232	U	-0.031	+/-0.032	0.231	1.00	pCi/L						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, liquid												
Alpha	U	1.39	+/-1.07	1.90	5.00	pCi/L		ATH1	02/16/04	2015	310082	2
Beta	U	0.495	+/-0.812	1.69	5.00	pCi/L						
GFPC, Ra228, Liquid												
Radium-228		1.46	+/-0.603	1.09	3.00	pCi/L		BXD1	02/23/04	1146	310676	3
Rad Radium-226												
Lucas Cell, Ra226, liquid												
Radium-226	U	0.611	+/-0.436	0.616	1.00	pCi/L		JS1	02/19/04	1030	310007	4
Rad Total Uranium												
KPA, Total U, Liquid												
Total Uranium	U	-0.201	+/-0.00959	0.198	1.00	ug/L		PD	02/24/04	2003	310973	5

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	EPA 900.0	
3	EPA 904.0 Modified	
4	EPA 903.1 Modified	
5	ASTM D 5174	

Notes:
The Qualifiers in this report are defined as follows :

< Result is less than amount reported.
> Result is greater than amount reported.
B Target analyte was detected in the sample as well as the associated blank.
BD Flag for results below the MDC or a flag for low tracer recovery.
E Concentration of the target analyte exceeds the instrument calibration range.
H Analytical holding time exceeded.
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit.

3075-07

O & M, Inc.

Environmental Operations and Maintenance Management

450 Montbrook Lane
Knoxville, TN 37919
(865) 691-6254
Fax (865) 691-9595

MONTHLY REPORT
OPERATION & MAINTENANCE
FIELDS BROOK SUPERFUND SITE
ASHTABULA, OHIO
March 2004

Date: April 2, 2004

To: Robert Rule, ***de maximis, inc.***

From: Valerie Rule, O & M, Inc. VAR

This report summarizes the conditions and activities related to the Fields Brook Superfund Site (the Site) and Landfill, as well as other pertinent information regarding the Site for the month of March 2004. Also included is a copy of the monthly Inspection and Maintenance Report. The Site Technician is Mr. Ron McVoy.

Activities Performed:

- Scheduled inspections and routine maintenance activities were performed in conformance with the Consent Decree / Fields Brook Operation, Maintenance and Monitoring Plan (OM&MP).
- The monthly inspection was performed on March 21, 2004. A copy of the Inspection and Maintenance Log is attached.
- Access was provided for the following persons during the month of March:

VISITORS		
DATE	**NAME / COMPANY**	**PURPOSE**
3/9/04	Microbac	Sampling
3/16/04	Lee Cook GEM	Leachate Pickup for transport and disposal
3/18/04	Karen Eglinton Earthline	Landfill Inspection

Problems Encountered:

No problems were encountered during the month of March.

Leachate Pumped:

A leachate pickup was performed on March 16, 2004. 5,500 gallons were removed for transport and delivery to General Environmental Management (GEM) in Cleveland, Ohio. GEM is a recycling and pretreatment facility that receives and processes a wide variety of industrial by-products, including wastewaters. The facility treats the water before discharge to the publicly owned treatment works. A copy of a description of their wastewater treatment process is attached to this report.

Scheduled Activities:

The following activities are scheduled to be performed in April, 2004:

1) A leachate pickup is scheduled for April 5, 2004.

2) The leak detection riser will be extended to stay above stormwater level.

3) A Site Walk is scheduled for April 19, 2004. Three additional leachate samples will be collected (the QAPP requires analysis for standard VOCs and SVOCs, while the disposal company required analysis for TCLP VOCs and SVOCs). The parameter Lead also will be re-analyzed at this time.

4) O & M, Inc. will continue to perform inspections and routine maintenance activities conformance with the Consent Decree / Fields Brook OM&MP.

5) O & M, Inc. will continue to direct subcontractors as needed at the site.

Inspector Name: MCVoy
Date/Time On Site: 3-21-04
Weather: Wet, Cool
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
1. Fence/Access Control					
a. Fence	Vandalism, collapse, holes	✓			
b. Gate	Vandalism, collapse, functional inadequacy	✓			
c. Locks	Inoperative, missing	✓			
d. Signs	Vandalism, unreadable, collapse, missing	✓			
2. Access Roads	Ruts	✓			
	Potholes	✓			
	Debris	✓			
2. Cover Integrity					
a. Surface Features	Animal burrows, washouts, cracks	✓			
b. Slopes	Washouts, breakouts and sloughing	✓			
c. Vegetation	Bushes/tree growth, bare spots	✓			
d. Settlement	localized depressions, sloughing on slopes	✓			
3. Gas Vents					
a. Pipe boot	Damage or obstructions to vent pipes and sampling ports	✓			
b. Concrete pad	Damage, Excessive weeds/growth	✓			
4. Leachate Collection System					
a. Leachate	Level, silt build-up				
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓	WILL EXTEND Risers 12"		
5. Leachate Detection System			↓ ↓ ↓ ↓		
a. Leachate	Level, silt build-up	✓			
b. Riser caps and locks	Damage, cracks, inoperative or missing lock	✓			
6. Groundwater Monitoring Wells					
a. Locking cap	Damage, cracks, inoperative or missing lock				
b. Protective casing	Cracked, missing				
c. Concrete collar	Cracked, missing				
d. Local erosion	Ponding, water channels				
e. Performance (if sampling performed this period)	Did wells recharge well, high turbidity, other signs of silting				

Lower Leachate - Probe depth 66'0" - No water detected
Upper Leachate - Probe depth 23'6" - Water detected
(Called Gem - can't haul until week of 4/5/04 due to excess rain at dump site causing problems)

P:\data\19\Draft 6030414 Fun Fluid Monit010.wpd

Inspector Name: MC Voy
Date/Time On Site: 3-29-04
Weather: W/D, Cool
Signature: [signature]

Table 6-1
Inspection and Maintenance Log
Fields Brook Superfund Site

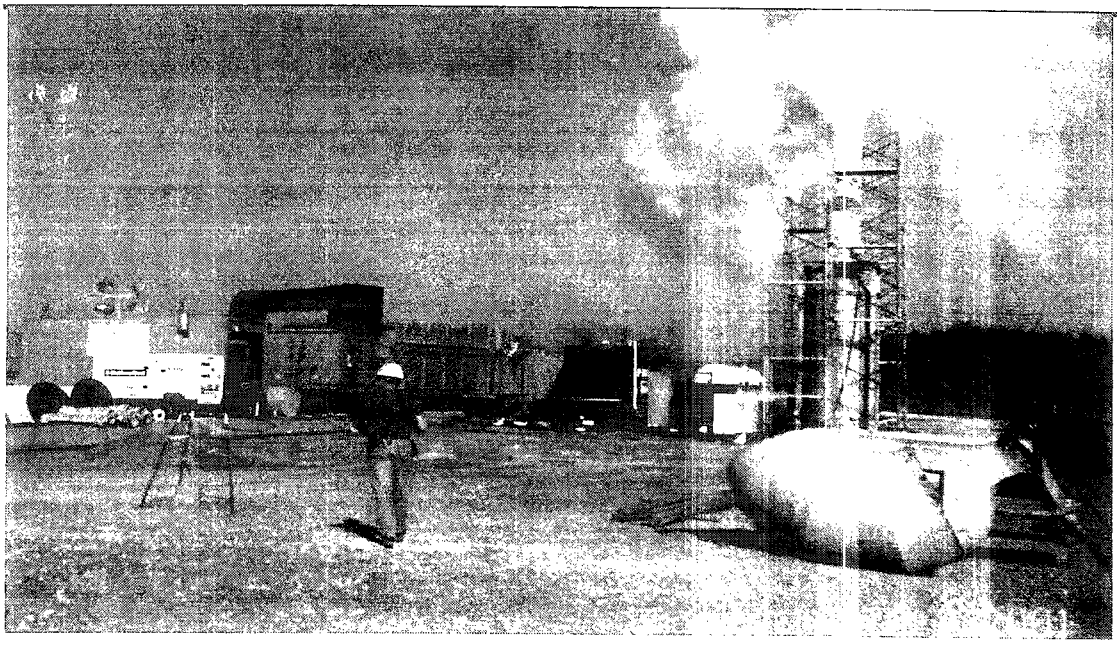
Feature	Trouble Signs	Status	Problem Location and Description	Action	Date
7. Stormwater Management System					
a. Perimeter Channels	Buildup of sediment or debris, sloughing, washouts, erosion of vegetative cover, riprap lining displacement or washout, excessive vegetative growth	✓	—	—	
b. Spillways	Buildup of sediment greater than 2 inches Check for blockage with light source Buildup of debris, riprap outlets disturbed, damage to spillway	✓			
8. FWA / Brook (SOU) Inspection					
a. FWA	Bare spots, wash outs	✓			
b. Brook	Erosion, wash outs, sloughing, silting, rip rap integrity	✓			

Leachate Removal:

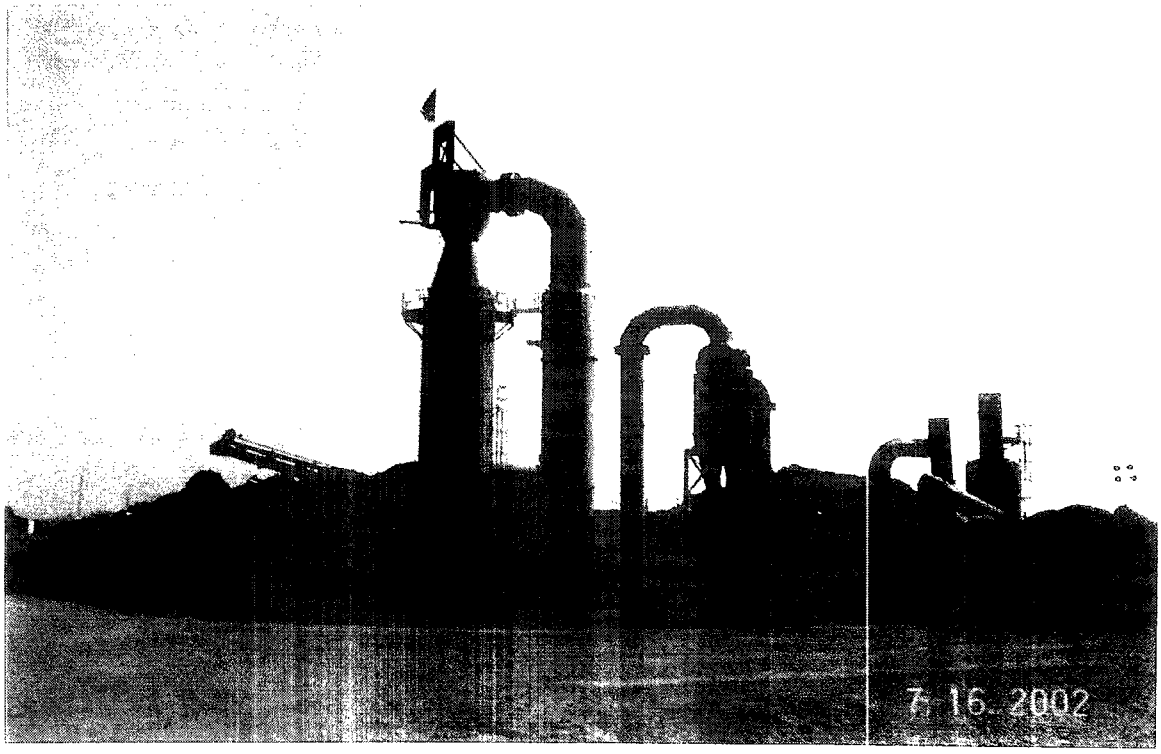
Date/time 3/16/04				
Volume removed	5500 gals			
Manifest No. (attach original)	403			
Transporter	KEPICH TRANSPORT			
Disposal Facility	GEM			
Sample Collected? (yes/no)				
Laboratory used				
Analysis required (attach copy of COC)				

Comments:

cc: OM&M Project Manager



SoilPure LTTD Plant



ESMI LTTD Plant/Treated Soil

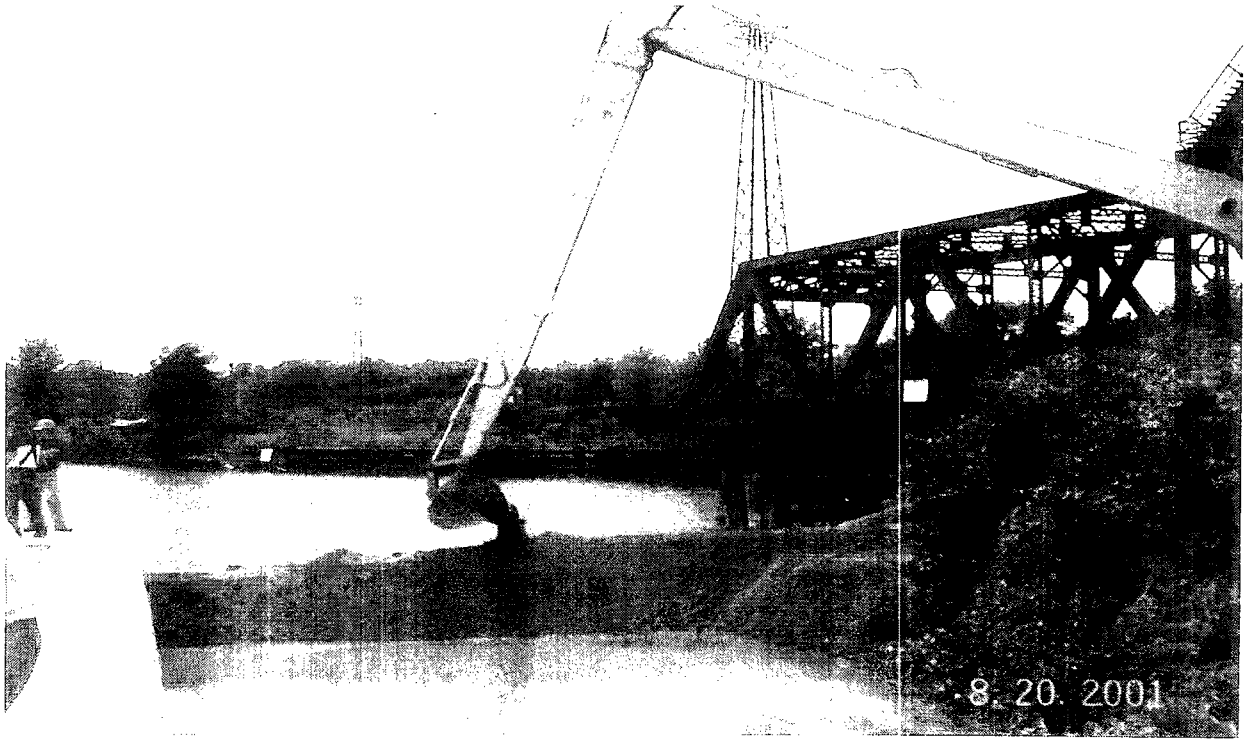
Photographic Log
FIELDS BROOK SUPERFUND SITE
FINAL CONSTRUCTION REPORT
Ashtabula, Ohio

Re-Establishment of Vegetation - EU2

EU1 Following Restoration

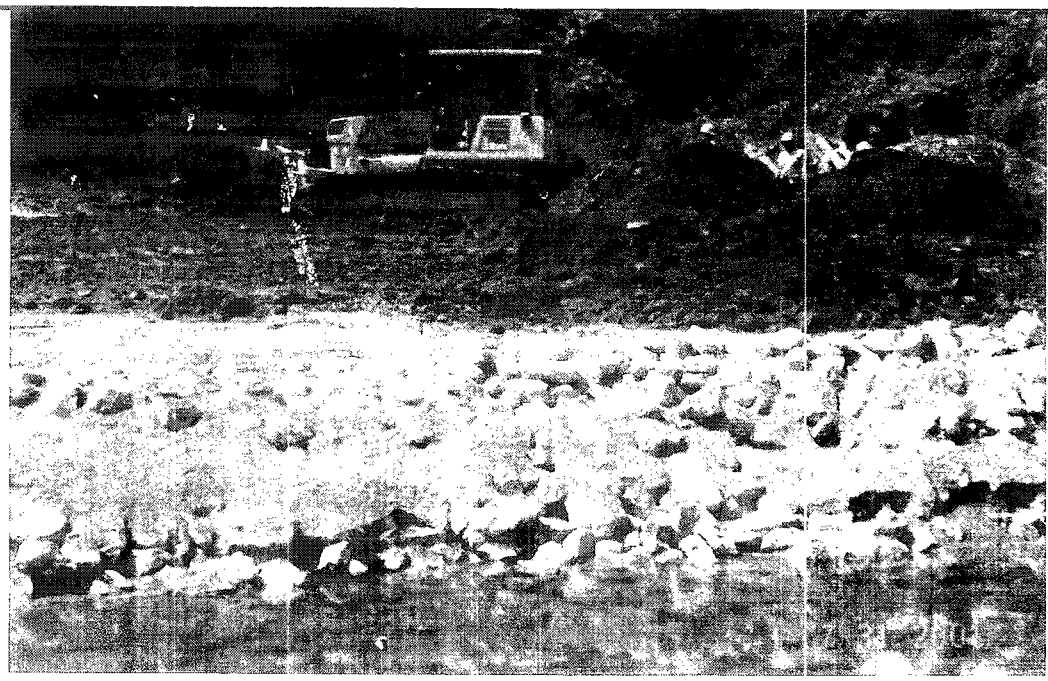
Photographic Log
FIELDS BROOK SUPERFUND SITE
FINAL CONSTRUCTION REPORT
Ashtabula, Ohio

Backfill Placement-EU2

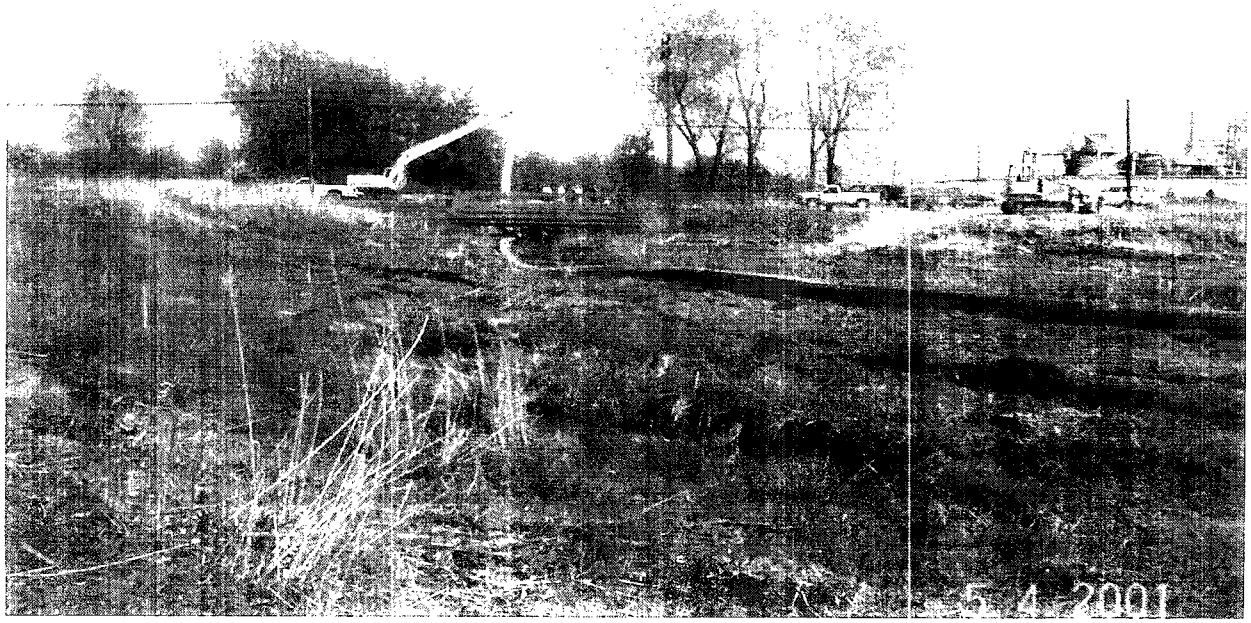


Isolation Berm Placement in EU1 at the Ashtabula River

Photographic Log
FIELDS BROOK SUPERFUND SITE
FINAL CONSTRUCTION REPORT
Ashtabula, Ohio

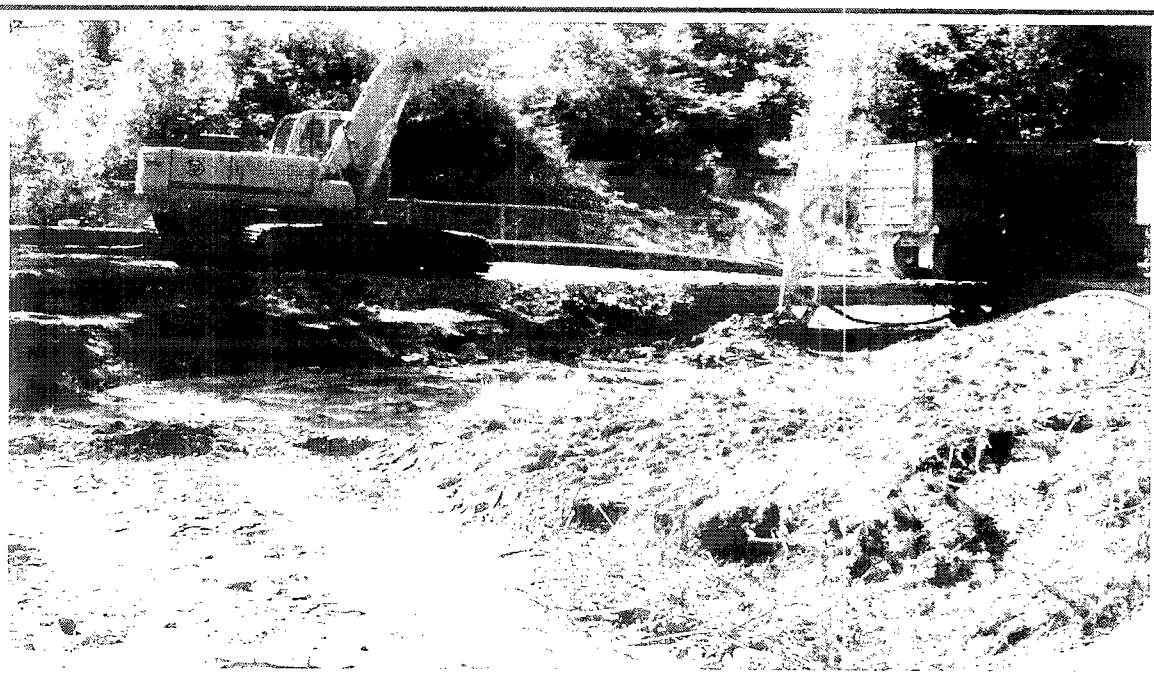


Floodplains/Wetlands Area Backfill Placement

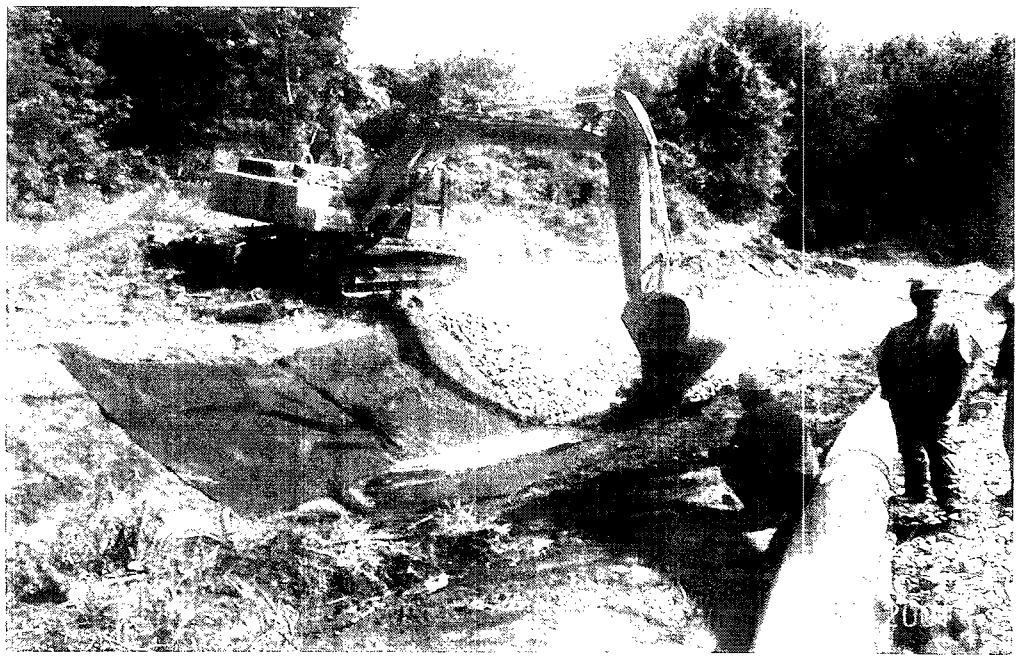


Typical Creek Diversion Piping

Photographic Log
FIELDS BROOK SUPERFUND SITE
FINAL CONSTRUCTION REPORT
Ashtabula, Ohio



Sediment Operable Unit Excavation



Sediment Operable Unit Backfilling/Restoration

Photographic Log
FIELDS BROOK SUPERFUND SITE
FINAL CONSTRUCTION REPORT
Ashtabula, Ohio

DNAPL Excavation Activities

Photographic Log

FIELDS BROOK SUPERFUND SITE

FINAL CONSTRUCTION REPORT

Ashtabula, Ohio

Detrex Corporation Operable Unit
Five-Year Review Report
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Attachments:

(1) Figure Detrex-1	Site Map Showing Remediation-Related Features
(2) Table Detrex-1	DNAPL Collected By Month
(3)	Correspondence dated February 9, 2004 from T. Steib to T. Van Donsel

List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
HCB	Hexachlorobenzene
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ODH / BRP	Ohio Department of Health / Bureau of Radiation Protection
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
piC/g	Pico-curies per gram
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination at the Detrex Corporation Operable Unit of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the construction of a partial slurry well, excavation and disposal of sediments within a retention basis and drainage ditch, installation of a soil cover over an area of low-level soil contamination, construction of a groundwater intercept trench and installation of DNAPL extraction wells.

The assessment of this five-year review found that the remedy is functioning as designed but the DNAPL Recovery System has operational difficulties. However, with the elements of the remedial action currently in place, U.S. EPA has evaluated the situation and determined that Fields Brook is protected in the short-term. The long-term protectiveness of the cleanup cannot be assessed at this time as it relies on the continued operation of the remedial action components and a maximization of DNAPL removal from the site. Although complete removal of DNAPL is not possible, DNAPL is considered a principal threat at the Detrex operable unit and its presence at the site presents a risk to Fields Brook absent the continued operation and maintenance of engineering controls. For this reason, additional work is necessary to address operational difficulties with the existing extraction wells, to expand the DNAPL extraction system to achieve broader DNAPL removal, and to finalize and implement O&M requirements.

As with all source control remedial actions, the scope of the required cleanup was limited to actions necessary to protect Fields Brook from recontamination. No assessment was made as to the sufficiency of the remedial action in terms of addressing human health and ecological risks within the Detrex property. The immediate threats to Fields Brook from contamination at the Detrex Corp operable unit have been addressed and the remedy is currently protective of human health and the environment, in terms of contaminant contributions to Fields Brook.

Five-Year Review Report
Detrex Corporation

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the Detrex Corporation Source Control Operable Unit (Detrex). The Ohio Environmental Protection Agency (OEPA) provided support in the development of this five-year review.

This is the first five-year review for the Detrex Operable Unit of the Fields Brook Site. The cleanup of the Detrex was initiated in August 2000 and became operational and functional in October 2002, with the start of operation of the DNAPL extraction system. Although the overall remedial elements currently in place are protective of Fields Brook in the short term, Detrex is preparing to expand its Dense Non-Aqueous Phase Liquid (DNAPL) extraction system to speed DNAPL recovery, broaden the area of removal and to provide for increased long-term protectiveness.

The purpose of the cleanup at the Detrex operable unit was to address contaminated surface soils, sediment and DNAPL that had the potential to move into Fields Brook.

II. Site Chronology

Event	Date
Detrex facility constructed	1947
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS.	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigated possible source control areas.	1992 – 1995
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed six individual source control areas, including Detrex Corporation.	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the Detrex Corporation RD/RA..	December 1997
U.S. EPA approval of Phase I (slurry wall & earth work) RD	May 22, 2000
U.S. EPA approval of Phase I RA Work Plan	August 30, 2000
Earth work, including construction of slurry wall	August 2000 - July 2001
U.S. EPA approval of Phase II (DNAPL Recovery) RD	October 4, 2001
U.S. EPA approval of Phase II RA Work Plan	December 6, 2001
Construction of DNAPL extraction system	Summer 2002
DNAPL extraction commenced	October 2002

III. Background

Physical Characteristics

The Detrex Corporation is located in the northwestern portion of the Fields Brook watershed adjacent to the north bank of the main channel of Fields Brook. The facility encompasses 58 acres. Structures on the property include a process building, office building, and numerous aboveground storage tanks that are either within diked areas, paved areas, or on ground surfaces. The northern one-third of the property is used as an active manufacturing area and the southern two-thirds is largely undeveloped.

The area is located in the Lake Plain physiographic province of Ashtabula County. The elevation of the Lake Plain ranges from 620 ft mean sea level (MSL) to 660 ft msl. In general, the subsurface geology of the Fields Brook watershed near Detrex consists of three geologic formations. In descending order, these formations are: glacial-lacustrine, glacial till, and shale bedrock.

Land and Resource Use

As noted above, Detrex is an operating facility. It is a chemical manufacturing company, currently producing pyrrole, n-methyl pyrrole, hydrochloric acid, and zinc dialkyldithiophosphates (ZDDP). The product of the n-methyl pyrrole and pyrrole reactions are distilled to give n-methyl and pyrrole as product and non-hazardous still bottoms. Past operations at this plant included the chlorination of acetylene to produce trichloroethene and tetrachloroethene.

According to information from the Ohio Department of Natural Resources, the groundwater production potential of the area within the watershed is considered very limited and not capable of yielding water at rates greater than 3 gallons per minute. No drinking water wells are located within the industrialized portion of the watershed. The water supply for the industries and residences in the area is from Lake Erie.

History of Contamination

The chemicals of interest at Detrex from current operations include furan, monomethyl amine, n-methyl pyrrole (NMP), pyrrole, ammonia, phosphorous pentasulfide, chlorine, and hydrochloric acid while the chemicals from past operations included tricholoroethene, 1,1,2,2-tetrachloroethane, hexachlorobutadiene (HCBD), and tetrachloroethene.

Results from sampling conducted during the Source Control RI indicated that surface soil exceedances for Fields Brook contaminants of concern were identified in several areas of the Detrex facility. These areas include: the stormwater collection ditch on the northern property line, several abandoned retention ponds, construction debris piles, sediment in the stormwater settling collection basin, and a catalyst pile. In addition, the recontamination assessment identified a Dense Non-Aqueous Phase Liquid (DNAPL) in the groundwater on the Detrex facility. The assessment determined that the following areas should be addressed to reduce possible sources of future contamination to Fields Brook:

1. Seven Closed Lagoons

The closed lagoons are located in the northeastern portion of the Detrex facility. Subsurface soil samples collected from the area surrounding the lagoons were found to contain several volatile and semi-volatile organic compounds at concentrations exceeding occupational cleanup goals (CUGs). In addition, DNAPL was identified in the shallow groundwater bearing formation both in the closed lagoon area and at off-site locations on RMI Sodium, the adjacent property. A sample of DNAPL was collected from one of the

on-site monitoring wells in order to characterize this material. Four volatile organic compounds were identified (1,1,2,2-tetrachloroethane, 1,2-dichloroethene, tetrachloroethene, and trichloroethene). Three semi-volatile organic compounds were identified (hexachlorobenzene, hexachlorobutadiene, and hexachloroethane).

2. Sources Within the Surface Water Treatment System

The surface drainage system in the northern industrialized portion of the Detrex facility was modified to collect and treat surface water. Of the area within the bounds of the surface water treatment system, approximately 60,000 sq.ft of surface area had soil with CUG exceedances. The ponded area in the lagoon area covers approximately 4,000 sq.ft. In addition, approximately 1,500 sq.ft. along the drainage ditch had surface soil CUG exceedances. The area that is located within the bounds of the surface drainage system is underlain by the subsurface DNAPL plume

3. Sources Outside the Surface Water Collection System

In the Source Control RI Report, the catalyst piles were not considered a potential source of sediment recontamination. A surface soil sample located downslope of the floodplain detected a concentration of 40 ppm PCBs. Subsequent sampling of the catalyst material found the presence of PCBs greater than occupational CUGs for the Fields Brook sediment. Additional sampling of the three catalyst piles indicated PCB concentrations ranged from 2 to 5 ppm. These catalyst piles were located on the southern portion of the Detrex property, in close proximity to Fields Brook.

Initial Response

In late 1986, the U.S. EPA began negotiating with a number of Potentially Responsible Parties (PRPs) to conduct the source control RI/FS activities and sediment operable unit design activities. The PRPs are comprised of the companies who are considered the owners and operators of the chemical industries and waste disposal sites surrounding Fields Brook. The PRPs also include the companies who, by contract, agreement, or other means, either accepted, or arranged for transport, disposal or treatment of, hazardous substances within the Fields Brook site.

In 1989, the PRPs were issued a Unilateral Order to design a remedy for the Fields Brook sediments, complete a Remedial Investigation to identify the sources of contamination, and develop and evaluate cleanup alternatives for the sources of contamination. From 1992 to 1995, the PRPs evaluated 94 areas of potential contamination within the Fields Brook watershed to determine whether they were a source of past contamination or could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater.

As a result of this evaluation, the PRPs identified five industrial properties as sources of contamination to Fields Brook. The industrial properties include Detrex, Millennium Plant II TiCl4 (formerly SCM), Acme Scrap Iron and Metal, RMI Metals, and Conrail. In addition, several sewer systems located to the north and south of Fields Brook were also found to be potential sources of contamination. Detailed information about the types and extent of contamination at the source areas, including Detrex, can be found in the Source Control RIreports. The final Phase 1 Source Control RI was approved in May of 1997.

In conjunction with the preparation of the Source Control Remedial Investigation Report, the PRPs prepared a Source Control FS to identify and evaluate cleanup alternatives. The Source Control FS was finalized in June, 1997. The report describes the initial screening of alternatives, the identification of a range of remedial alternatives, and the detailed analysis of the assembled alternatives for each of the five properties and the sewer systems, including Detrex.

Basis for Taking Action

Evaluations of organic chemical contamination in Detrex's soils and groundwater and the presence of DNAPL below Detrex led U.S. EPA to believe that Detrex was a potential source of recontamination to the brook. Remedial actions for the Detrex Corporation operable unit were selected in the September 29, 1997 Source Control ROD.

IV. Remedial Actions

Remedy Selection

The selected remedy for the Detrex source area required the containment and treatment of groundwater contamination by the construction of a partial slurry wall and vacuum-enhanced extraction wells. The selected remedy would also reduce the potential for migration of contaminated surface soil due to reach the DS Tributary and Fields Brook by containment of surface soil contamination, ditch cleaning, catalyst pile removal and retention pond sediment removal.

More specifically, the selected remedy for the Detrex Corporation Source Control Operable Unit consisted of the following:

a) Clear Debris and Vegetation, Remove Physical Hazards

In order to implement the remedial action, debris and vegetation were to be cleared in response and work areas. Physical hazards that could threaten workers were also to be addressed prior to the remedial action.

b) Construction of Partial Slurry Wall

A partial slurry wall was to be constructed to restrict the flow of groundwater contamination from the Detrex property. The slurry wall component was to extend beyond the downgradient portion of the on-site and off-site DNAPL and dissolved phase plume, and be located outside of the DNAPL area of impact. In addition, the slurry wall was to extend as necessary to ensure that the DNAPL and contaminated groundwater flowing towards Fields Brook or the DS Tributary, particularly along the northern and western directions from the Detrex facility, would be contained or captured.

The slurry wall was to be constructed of a soil-bentonite slurry or other clay mineral slurry. The permeability of the slurry wall was to be designed to be approximately 1 x 10^{-6} cm/sec. Due to the high percentage of naturally occurring clay soil material in the proposed slurry wall area, the ROD noted that it may be possible to reuse a portion of the excavation spoils by incorporating them into the slurry wall. The remaining excavation spoils were to be temporarily stockpiled on-site and characterized to evaluate on-site and off-site disposal options consistent with ARARs.

c) Vacuum-Enhanced Extraction Wells

Vacuum-enhanced extraction wells were to be installed near the leading edge of the DNAPL plume near the slurry wall and within the plume to lower groundwater and collect DNAPL in source areas. Based on pilot test results, approximately 36 extraction wells were anticipated.

Fluids collected from the vacuum-enhanced extraction wells were to be routed to a knockout tank to separate the vapor phase from the liquid phase. The vapor phase was to be treated with granular activated carbon to remove organic contaminant vapors before being released into the atmosphere.

The liquid phase from the knockout tank was to be conveyed to a DNAPL/water separator where DNAPL will be separated from water. The separated DNAPL was to be collected and transported to an off-site facility for treatment or recycling. The separated water was to be conveyed to the existing activated carbon treatment system at the Detrex facility.

d) Surface Water and Erosion Control / Soil Cover

Low-lying areas within the existing surface water collection system area on the Detrex facility and areas with surface soil occupational CUG exceedances were to be filled and regraded. In addition, these areas were to be covered with a 12-inch thick soil cover, an erosion control blanket, and a vegetative or crushed stone layer surface. Clean clay soil would be used for backfill. Regrading and vegetative cover would prevent ponding of surface water in former source areas and reduce infiltration of surface water into the ground. Sediments lying within retention basin DET7 and in the drainage ditch on the

northern boundary that collects surface water were to be excavated and analyzed to evaluate disposal options consistent with ARARs. Following cleaning, the ditch was to be filled with gravel or cement.

e) Catalyst Pile Excavation and Disposal

The catalyst pile material was to be excavated, evaluated, characterized and disposed of in a manner consistent with ARARs. Approximately 100 cu. yds of catalyst material contained in the three small piles and underlying soil was to be removed from the catalyst pile area. Upon completion of the removal of visible catalyst and excavation to the six inch depth, confirmation samples would be collected from the base of the excavation, prior to backfilling. Clean soil would be replaced in the excavation and the area would be regraded and revegetated.

f) Off-site Surface Water Control In The DS Tributary

In order to reduce the potential for subsurface water seepage to enter the DS Tributary in the northeast portion of the site, a 30-inch diameter culvert was to be installed in the DS Tributary to contain surface water flow and keep groundwater from entering the stream flow. This culvert was to connect to the existing culvert beneath State Road and extend along the northern side of the railroad spur, approximately 600 feet upstream. This configuration will entirely contain the surface water in the DS Tributary north of the Detrex facility, seal off potential groundwater seepage and prevent soil erosion. All joints will be sealed to eliminate seepage. Sediment beneath the culvert will be excavated to a depth of approximately 2.0 feet. The sediment excavated beneath the culvert would be analyzed to evaluate disposal options consistent with ARARs.

g) Institutional Controls, Chemical Monitoring and O&M

O&M activities for the vacuum-enhanced extraction well system were to include routine inspections of blowers, electrical equipment, belts, fuses, and pertinent operating parameters. O&M requirements for the slurry wall and regraded areas will consist of inspections, with regrading and revegetating, as necessary. Routine sampling of selected extraction wells will be required to monitor the effectiveness of the system. At a minimum, annual groundwater monitoring is to be conducted at points of compliance, with samples to be analyzed for DNAPL, VOC and SVOC parameters. In addition, water level data will be gathered on a semi-annual basis from all monitoring wells and piezometers installed inside and outside of the slurry wall to evaluate groundwater gradients within the remedial response area.

Storm water treatment system O&M activities, such as carbon replacement, is to remain the same as are currently used at the facility; however, the frequency of replacement will increase depending on the concentration of contaminants in the water pumped out of the extraction wells. O&M activities are to also include separator maintenance, handling and

disposal of DNAPL, and inspection and periodic sediment removal from the settling pond at DET7.

The outfall from the existing stormwater treatment system is to be monitored for existing NPDES monitoring requirements and DNAPL constituents not included as part of the current monitoring program. Samples will be collected at the same time as the NPDES monitoring.

Institutional controls are to be implemented for any area where hazardous substances, pollutants or contaminants will remain above levels that allow for unlimited use and unrestricted exposure. More specifically, institutional controls are to be implemented to protect the cover system, drainage controls, slurry walls, extraction and monitoring wells. Such institutional controls will include deed restrictions, security fencing, signs and restrictions on the placement of wells.

h) Points of Compliance

In conjunction with completion of the remedial action and performance of required O&M, sheet flow erosion and runoff from the Detrex facility must meet the occupational Cleanup Goals (CUGs) established for the Floodplain/Wetland and Sediment Operable Units. The points of compliance for surface runoff will be the property boundary and the DS Tributary. Groundwater contamination must also meet the occupational CUGs to prevent recontamination of the Brook. At a minimum, the points of compliance for the contaminants present in groundwater will be the edge of the slurry wall or, for areas without the slurry wall, the property boundary and the DS tributary. Contaminant levels at the Detrex outfall must meet residential CUGs to ensure that the 48" combined sewer can meet residential CUGs when it discharges to Fields Brook.

In addition to providing direction concerning points of compliance for monitoring, the Source Control ROD also provided considerations for the evaluation of the performance of a DNAPL extraction system. The ROD references U.S. EPA guidance that recommends that long-term remediation objectives of DNAPL remedies should be to remove free-phase, residual and vapor phase DNAPL "to the extent practicable". The ROD also notes that the DNAPL is a principal threat, selects a remedy requiring a combination of containment and active removal of DNAPL and states that "Complete removal of DNAPL in low permeability clay soils is not possible with currently available technology and treatment to asymptotic levels is expected". While recognizing the difficulties of DNAPL removal, the Source Control ROD emphasized DNAPL removal as an important element in the selected remedial action for the Detrex operable unit.

Remedy Implementation

Detrex elected to utilize URS (formerly Woodward Clyde, then URS Greiner Woodward Clyde) for the design and construction management tasks associated with the cleanup. U.S. EPA and USACE reviewed design plans for the slurry wall and the first phase of the DNAPL extraction

system. Because the design of the DNAPL extraction system would take longer than the design of the slurry wall, the designs were submitted separately so that remedial action work at the site could proceed as soon as possible. The remedial design for the slurry wall, groundwater trenches and soil work was approved in May of 2000. Construction of the slurry wall, installation of groundwater collection trenches and the excavation of accumulated sediment from drainage ditches began in August of 2000 and was completed in mid-2001. The slurry wall controls the movement of groundwater and provides for a system of drains that collect groundwater and run it through Detrex's existing water treatment plant. Site contaminants of concern are addressed in the facility's existing NPDES permit. In addition to the construction of the slurry wall, small areas of surface soil contamination were regraded and covered to prevent recontamination to the brook.

Based on U.S. EPA's experience, it is known that removal of subsurface DNAPL is one of the more difficult remedial actions to implement and operate. Therefore, U.S. EPA and Detrex agreed that the DNAPL extraction system could be phased in to allow the system to be expanded based on field performance data and so that the design could be modified to address any problem experienced in the first phase of extraction wells. The remedial design for the phase 1 of the DNAPL Extraction System was approved by U.S. EPA on October 4, 2001. Detrex constructed the system in the summer of 2002. Upon startup in October 2002, Detrex encountered some severe operational difficulties (such as product crystallization and plugging of wells) and eventually had to move to a less automated approach to running the system since they found the extraction system requires close operator attention to maintain. Of the twelve recovery wells installed, only eight are currently in operation due to short circuiting of air pressure to the ground surface. See Attachment Detrex-1 for correspondence that details operational difficulties. Although it is expected that Detrex will make system modifications to ease their current difficulties and expand the system to increase recovery, the system currently is operational. In concert with the slurry wall and groundwater collection system, the extraction system is expected to prevent the recontamination of Fields Brook by the DNAPL and groundwater contamination that is present below the Detrex facility. As of March 2004, 5,683 gallons of DNAPL have been collected and sent off-site for recycling or disposal. See Table Detrex-1 for a record of DNAPL extraction volumes. Table Detrex-2 outlines DNAPL disposal volumes and methods.

To expand the system and allow for more efficient and timely recovery of DNAPL, Detrex is moving forward with the design of additional DNAPL extraction wells. In February 2004, Detrex submitted a draft design for new test extraction wells and in March 2004, Detrex submitted a revised O&M Plan for U.S. EPA review. It is hoped that the redesign of the wells and pump system will ease operational difficulties. These new test wells are a step toward expanding and updating the DNAPL recovery system to improve recovery and decrease the amount of routine O&M required. U.S. EPA has sought the assistance of technical support staff in U.S. EPA's Ada, Oklahoma laboratory to provide recommendations to Region 5 and Detrex on how to minimize operational difficulties.

System Operations and Maintenance

Detrex is currently operating under a draft Operations and Maintenance Plan that is primarily limited to the inspection and upkeep of the extraction system. The slurry wall and groundwater collection trench are in place and DNAPL is currently being extracted. Current efforts are focused on improving current system operation and planning for the construction of additional extraction wells. Detrex has revised the O&M Plan to be consistent with modifications planned for the current system and the needs of the expanded system. Detrex submitted this revised O&M Plan to U.S. EPA in March 2004 and the document is currently undergoing U.S. EPA review. Upon approval of the revised O&M Plan, water levels and product thickness data will be collected and chemical monitoring will commence to allow evaluation of long-term containment and the removal of DNAPL (considered a principal threat).

V. Progress Since the Last Five-Year Review

This is the first Five-Year Review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA and the potentially responsible party for the Detrex source control area, were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Thomas Steib, Detrex Corporation

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of the five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook and when additional information is available on the performance of the Detrex DNAPL extraction system.

Document Review/Data Review

The following documents were reviewed:

1. Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997;

2. Remedial Action Work Plan for the DNAPL Recovery System, May 2001;

3. Monthly Reports - May 2001 to April 2004; and

4. Correspondence between U.S. EPA and Detrex regarding difficulty in the operation of the DNAPL extraction system.

A site inspection of the Fields Brook Site, including the Detrex Corporation operable unit, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes, from the physical structures put in place (the groundwater collection trench, partial slurry wall and DNAPL extraction wells), there is confidence that the pathways to the brook have been cut off and that Fields Brook is protected in the short-term from the contamination at Detrex. However, because the final O&M Plan has not yet been implemented, data is not yet available to track improvements in the DNAPL and dissolved-phase contamination at the site, and to verify that sheet-flow erosion off the site is not causing exceedances in the brook.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedialaction objectives (RAOs) used at the time of the remedy selection still valid?

Yes, there has been no change to the organic cleanup requirements for Fields Brook. The Remedial Action Objectives for the Detrex Operable Unit are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that would cause the Agency to question the protectiveness of the remedy in terms of contributions of volatile and semi-volatile organic contaminants and PCBs to Fields Brook.

VIII. Issues

Work completed to date on the remedial action is sufficient to satisfy the scope of the cleanup over the short-term. For long-term protection of the brook, operational difficulties associated with the DNAPL extraction system should be minimized, the DNAPL extraction system should be expanded to speed and broaden the extent of DNAPL removal and a comprehensive O&M Plan should be implemented.

Detrex has not yet implemented the institutional controls required by the Source Control ROD. It is necessary for Detrex to place the conditions on its deed to ensure that the engineering systems put in place at the site will be protected over the long term.

Detrex has had difficulty meeting its NPDES requirements for its discharge to Fields Brook. Only once has the violation been due to contaminants that are directly attributable to the DNAPL, residuals of which are found in the aqueous phase that is sent to Detrex's on-site treatment system. U.S. EPA Superfund Division has provided written notification to Detrex that it must comply with their NPDES requirements or U.S. EPA may determine that their system is not performing properly and require the performance of additional remedial action measures. While recent discharges may not be directly attributable to their treatment of water from the DNAPL extraction system, unacceptable discharges into Fields Brook are a concern for the long-term health of the brook.

The U.S. EPA and Ohio EPA inspection conducted on May 6, 2004, identified two items that Detrex must address to ensure proper health and safety at the site. The air within the pump houses at the site is impacted by the organic contamination within the DNAPL extracted. The extent of contamination in the pump house air is not currently monitored because air monitoring equipment is not available at the facility. Therefore the system operator may be entering areas without the necessary respiratory protection. In conjunction with this finding, it was noted that the health and safety plan currently in place for the Remedial Action should be supplemented with a health and safety plan customized for the O&M activities.

Issue	Affects Current Protectiveness (Y / N)	Affects Future Protectiveness (Y / N)
Resolution of Current Operational Difficulties Associated with the DNAPL Extraction System / Expansion of DNAPL System / Implementation of O&M Plan	**N**	**Y**
Implementation of Institutional Controls	**N**	**Y**
Alleged NPDES Violations	**N**	**Y**

Issue	Affects Current Protectiveness (Y / N)	Affects Future Protectiveness (Y / N)
Availability and trained use of air monitoring equipment to monitor Remedial Action structures	**N (operator health and safety issue)**	**N (operator health and safety issue)**
Development of O&M Health and Safety Plan	**N (operator health and safety issue)**	**N (operator health and safety issue)**

IX. Recommendations and Follow-up Actions

U.S. EPA will continue to work with Detrex in its effort to optimize current system operations. As part of this effort, U.S. EPA Region 5 will continue its coordination with U.S. EPA's Robert S. Kerr Laboratory in Ada, Oklahoma in an effort to identify solutions to current extraction difficulties. Solutions found to current difficulties will be utilized in the design of the expanded extraction well network.

In February 2004, Detrex submitted to U.S. EPA a preliminary plan for the expansion of the DNAPL extraction system. In March 2004, Detrex submitted a revised O&M Plan. These plans are currently undergoing review in Region 5 and at U.S. EPA's Robert S. Kerr Laboratory.

Detrex will be directed to implement the institutional controls to ensure protection of the remedial systems in place at the site.

U.S. EPA Superfund Division should maintain contact with the Region 5 Water Division and Ohio EPA to ensure that Superfund is aware of Detrex NPDES violations. This is important for the evaluation of the Detrex operable unit remedy and for monitoring the long-term health of the brook and floodplain.

Detrex is required to address health and safety concerns identified at the site inspection by making available air monitoring equipment and training personnel in its use. In addition, the health and safety plan for the remedial action shall be supplemented with a health and safety plan customized to address O&M activities.

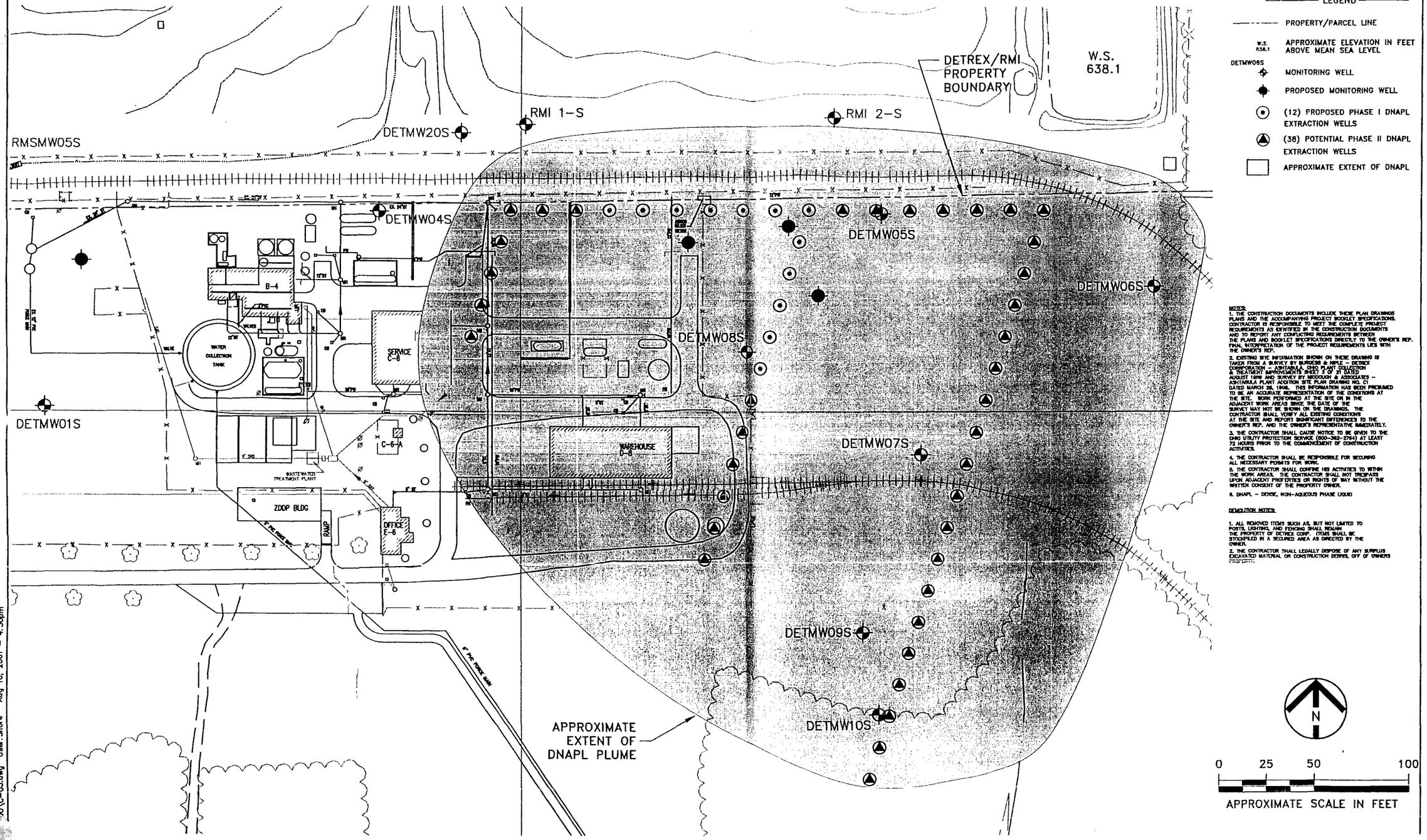
Issue	Responsible Party	Required Date for Resolution of Action Item
Resolution of Current Operational Difficulties Associated with the DNAPL Extraction System / Expansion of DNAPL System / Implementation of O&M Plan	U.S. EPA - Robert S. Kerr Laboratory Detrex Corp - construction of test wells, evaluation of their performance and system expansion.	Recommendations by May 31, 2003 Schedule to be determined based on scope of recommendations to be made by U.S. EPA
Implementation of Institutional Controls	Detrex Corp.	July 30, 2004
Alleged NPDES Violations	U.S. EPA RPM will require Detrex to cc Region 5 Superfund Division on its monthly NPDES reporting.	July 30, 2004
Availability and trained use of air monitoring equipment to monitor Remedial Action structures	Detrex Corp.	June 30, 2004
Development of O&M Health and Safety Plan	Detrex Corp.	July 30, 2004

X. Protectiveness Statement

Based on the implementation of the approved design, the remedy implemented for the Detrex Corp operable unit is protective of human health and the environment in the short-term, pursuant to the remedial action objective of preventing recontamination of Fields Brook from organic chemical contamination in site soils, groundwater and DNAPL. The long-term protectiveness of the cleanup cannot be assessed at this time as it relies on the continued operation of the remedial action components and a maximization of DNAPL removal from the site. Although complete removal of DNAPL is not possible, DNAPL is considered a principal threat at the Detrex operable unit and its presence at the site presents a risk to Fields Brook absent the continued operation and maintenance of engineering controls. For this reason, additional work is necessary to address operational difficulties with the existing extraction wells, to expand the DNAPL extraction system to achieve broader DNAPL removal, and to finalize and implement O&M requirements.

XI. Next Review

The next five-year review for the Detrex Corporation Operable Unit of the Fields Brook Superfund Site is required by June 2009, five years from the date of this review.



NOTES:

1. THE CONSTRUCTION DOCUMENTS INCLUDE THESE PLAN DRAWINGS PLANS AND THE ACCOMPANYING PROJECT BOOKLET SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE TO MEET THE COMPLETE PROJECT REQUIREMENTS AS IDENTIFIED IN THE CONSTRUCTION DOCUMENTS AND TO REPORT ANY CONFLICTING REQUIREMENTS BETWEEN THE PLANS AND BOOKLET SPECIFICATIONS DIRECTLY TO THE OWNER'S REP. FINAL INTERPRETATION OF THE PROJECT REQUIREMENTS LIES WITH THE OWNER'S REP.
2. EXISTING SITE INFORMATION SHOWN ON THESE DRAWING IS TAKEN FROM A SURVEY BY BURGESS & NIPLE – DETREX CORPORATION – ASHTABULA, OHIO PLANT COLLECTION & TREATMENT IMPROVEMENTS SHEET 7 OF 21 DATED AUGUST 1996 AND SURVEY BY MCDOUGH & ASSOCIATES – ASHTABULA PLANT ADDITION SITE PLAN DRAWING NO. C1 DATED MARCH 28, 1996. THIS INFORMATION HAS BEEN PRESUMED TO BE AN ACCURATE REPRESENTATION OF THE CONDITIONS AT THE SITE. WORK PERFORMED AT THE SITE OR IN THE ADJACENT WORK AREAS SINCE THE DATE OF THE SURVEY MAY NOT BE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AT THE SITE AND REPORT SIGNIFICANT DIFFERENCES TO THE OWNER'S REP. AND THE OWNER'S REPRESENTATIVE IMMEDIATELY.
3. THE CONTRACTOR SHALL CAUSE NOTICE TO BE GIVEN TO THE OHIO UTILITY PROTECTION SERVICE (800-362-2764) AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS FOR WORK.
5. THE CONTRACTOR SHALL CONFINE HIS ACTIVITIES TO WITHIN THE WORK AREAS. THE CONTRACTOR SHALL NOT TRESPASS UPON ADJACENT PROPERTIES OR RIGHTS OF WAY WITHOUT THE WRITTEN CONSENT OF THE PROPERTY OWNER.
6. DNAPL – DENSE, NON-AQUEOUS PHASE LIQUID

DEMOLITION NOTES:

1. ALL REMOVED ITEMS SUCH AS, BUT NOT LIMITED TO POSTS, LIGHTING, AND FENCING SHALL REMAIN THE PROPERTY OF DETREX CORP. ITEMS SHALL BE STOCKPILED IN A SECURED AREA AS DIRECTED BY THE OWNER.
2. THE CONTRACTOR SHALL LEGALLY DISPOSE OF ANY SURPLUS EXCAVATED MATERIAL OR CONSTRUCTION DEBRIS, OFF OF OWNERS

REV	DESCRIPTION OF REVISION	BY	DATE
0	100 PERCENT DESIGN SUBMITTAL	MMS	3/28/01
1	REVISED FOR BID	MMS	7/24/01
2	REVISED FOR BID	NRH	8/10/01
3			
4			
5			

FINAL DESIGN SUBMITTAL
Revision 2

URS
800 W. St. Clair Ave., Suite 500
Cleveland, Ohio 44113

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED	DAS
DRAWN	MMS
CHECKED	DAS
PEER REVIEWED	KMA
PROJECT MANAGER	MLS
DATE	4-10-01

SITE PLAN WITH AREA OF DNAPL PLUME IDENTIFIED
SOURCE CONTROL REMEDIAL COMPONENTS
DETREX CORPORATION FACILITY
ASHTABULA, OHIO

C:\Detrex\8E08011\0\C-03.dwg User:Shore Aug 10, 2001 - 4:30pm

Figure Detrex-1

Table Detrex-1

DNAPL Recovery As Reported in Monthly Reports

Month	Water / DNAPL Pumped (in gallons)	DNAPL Recovered (in gallons)
Startup Phase October 2002 - February 2003	2411	220
March 2003	1462	381
April 2003	3087	404
May 2003	2752	1167
June 2003	3978	846
July 2003	3867	1382
August 2003	4277	558
September / October	3361	– * Operational difficulties and equipment replacement * System off-line from September 22 to October 6, 2003
November 2003	337	300
December 2003	1317	200
January 2004	207	116
February 2004	* Totalizer malfunctioned. No accurate way to measure total liquids pumped.	----
March 2004	* Totalizer repaired, but total volume pumped not recorded in monthly report.	240
Approximate TOTAL Volume of DNAPL		**5812**

February 9, 2004

Ms. Terese Van Donsel
United States Environmental Protection Agency
Office of Superfund, Region 5
SR-6J
77 West Jackson
Chicago, IL 60604-3590

Subject: Fields Brook Superfund Site
Detrex Source Area-Ashtabula, Ohio
Docket No. V-W-98-C-450

Dear Ms. Van Donsel,

As discussed, attached are additional discussions, corresponding supportive data, and photographs, prepared by Detrex, as to our request for the EPA to consider a technical infeasibility for the practical recovery of DNAPL on the Detrex property.

If you have any questions, please contact me at (440) 997-6131, ext. 201.

Sincerely,

Thomas W. Steib
Operations Manager

cc: T. Mark, T. Doll, D. Church, R. Currie, K. Mast

MEMORANDUM OF DIFFICULTIES ENCOUNTERED
IN OPERATION OF THE DETREX CORPORATION
DNAPL RECOVERY SYSTEM

As the EPA knows, the Detrex DNAPL recovery system officially went on line in the month of October 2002. From the outset, the system was plagued with operational problems. The system was installed to work automatically but never has operated as intended.

The silt that was brought up with the DNAPL continuously plugged the valves that were installed, the diaphragm pumps needed continuous cleaning, the foot valves at the bottom of the wells were plugged with silt and never closed properly, the automatic solenoid valves plugged, and other plugging problems which rendered the process unusable as an automated process. One of the diaphragm pumps may be seen in the lower right portion of picture P205001.

The system had to be operated manually. This silt also had a negative effect on the settler. When the settler was designed, no one had any idea how much silt would be pumped along with the DNAPL. Since this is just an experimental design and implementation, no one had any thought that silt would not settle out of the DNAPL underground.

Due to the high density of the DNAPL, the fine particle size of the silt, and the added velocity of the DNAPL from the vacuum enhancement, no settling occurs underground but instead, the silt is pumped along with the DNAPL up to the settling tank. The tank was not designed to hold as much silt as was recovered.

The tank had to be cleaned often, which caused an air quality problem inside the building. Every time the settling tank was cleaned, it had to be opened up and drained. With the opening of the top lid, volatile portions of DNAPL evaporated and filled the building.

To help remedy the problem of silt entering the separator, 100 micron and 25 micron filters were installed ahead of the separator. A typical filter housing may be seen in picture PA170007 beneath the step ladder. Frequently, these filters plug up immediately due to the quantity of silt and crystals in the DNAPL.

This caused another problem of additional waste from the filters, the silt on the filters that were disposed of as hazardous waste, and inside a r quality problems from changing the filters. Once again, this filtration step would not allow us to operate the system automatically.

Two of the constituents of the DNAPL are crystals of hexachlorobenzene and hexachlorobutadiene (both of these to be called HBD). These crystals are much larger

in size than the silt and caused the air diaphragm pumps, the foot valves and the solenoid valves in the system to plug up. This is an ongoing problem and these crystals are ubiquitous throughout the DNAPL pool. Once again, this was an unexpected problem.

Crystals are also developed with the use of vacuum. As will be discussed below, vacuum is needed to bring the DNAPL to the well. Without vacuum, we are not able pump any DNAPL. On the other hand, using vacuum to retrieve DNAPL from the surrounding soil, causes crystals to form. These crystals cause plugging problems.

During the initial three months, some of the wells collapsed. To properly operate the wells, air pressure of about 5 psi is put on the wells. This air pressure blew away some of the sand pack around the wells. This permitted the air to short circuit the well and blow out of the surface of the ground. This may have contributed to the collapsing of several of the wells. This is an ongoing problem. Even with the longer sleeves around wells, we still get short-circuiting of the air and collapsing of wells. This collapsing of the wells caused us to shorten the wells so at least they would function. Obviously by shortening the wells, we reduce the yield of DNAPL since we are higher off the glacial till. Some wells collapsed so badly that we were forced to cap them rendering them useless.

Once we got through the original startup of the system in the fourth quarter of 2002, winter came. We were frozen from January 2003 until March. During this time, we began changing the solenoid valves to manual ball valves to eliminate plugging from silt and HBD. Further changing to air actuated ball valves may be seen in pictures P205001 and P205002. When we were able to pump, we continuously redeveloped the wells, continuously changed filters prior to the settling tank, and tried different amounts of vacuum to reduce the amount of silt, all to no avail.

The month of April was no different. We started to notice deformation of the well inserts. The cause of this well deformation was never positively determined. The separator was cleaned out several more times due to the silt and wells were redeveloped once again

In the month of May we discovered how big the silt problem was. Because we were not getting a good separation between the DNAPL and water, mainly because the silt causes an emulsion between the water and DNAPL that takes extensive time to break, we had an excursion of our NPDES. At that time, it was not known how long it took for the water/DNAPL emulsion to break. Unbeknownst to us, we were allowing DNAPL to get into our stormwater treatment system. This DNAPL saturated our carbon beds. Once the carbon beds were saturated, they did not remove the organics from our stormwater.

This excursion of our NPDES was organics in our discharge to Fields Brook. We immediately began the process of changing the separator to a 600 gallon round bottom stainless steel tank. This tank is shown in pictures PA170004 and PA170007. This

DNAPL/water emulsion caused by silt is a continuous problem that will never be remedied.

During the entire summer of 2003, we experienced the usual plugging problems from silt, crystals, and collapsing of the wells. We began programs of replacing the HDPE lines, which were sagging and enhancing our plugging problems, replacing the solenoid valves with ball valves, replacing the pump houses with bigger, better insulated buildings to prevent winter time freezing, and installing the 600 gallon separator tank.

The inside of the pump houses, the stainless steel lines, and new air actuated ball valves can be seen in pictures P2050001 and P2050002. The exterior of the north pump house looking east toward the HDPE DNAPL storage tank can be seen in picture P2050012.

In the months of September and October, we capped three of the 12 wells due to plugging and collapse. We installed sleeves on eight of the 12 wells with mixed success. Even on the wells with sleeves, we still had air short-circuiting. The 600 gallon separator tank was installed to give better separation of the water and DNAPL. The project of replacing the HDPE lines with stainless steel lines had begun. Two new pump houses were built to replace the smaller, less insulated pump houses. All of these improvements are shown in the pictures submitted. The wells were continuously being redeveloped due to excessive silt build up.

In the month of November, we continued on the installation of the pumphouses and stainless steel lines. We still had three of the wells capped and the sleeves on the other wells showed limited success. The separator tank's site glasses were beginning to get plugged with silt so that separation needed constant and careful watching to avoid another NPDES violation.

In the month of December, we capped an additional two wells to give us a total of five wells out of twelve capped and not functional. The silt problem will never go away since the silt needs a significant amount of time underground to separate from the DNAPL. Since we need vacuum assist to pump the DNAPL, there isn't enough time for the silt to separate from the DNAPL. On the other hand, the vacuum that is needed to move the DNAPL causes more crystals to form in the DNAPL.

The month of January 2004 saw the return of cold wintry weather. Since January 6, 2004, we have been completely frozen.

Where do we go from here? There are two thoughts. One is to change the current well design such as a bigger sand pack, lower the sleeves to about one foot from the glacial till, no foot valves, make a finer screen, etc. Obviously, all of these to prevent us from pumping silt will lower our yield of DNAPL and will not cure the problem of well collapsing, air short-circuiting, crystals, etc. We will never prevent the pumping of silt. If we install a filter fine enough to prevent silt, we will not be able to pump any DNAPL. We have tried operating the wells with no air pressure. When we try to pump

with no air pressure, we don't get any DNAPL. Air pressure is needed in the range of at least 5 psi or more to help lift the DNAPL to the surface. With this much air pressure, short-circuiting occurs.

We tried to pump DNAPL with no vacuum. When we don't apply vacuum, we don't get any DNAPL since the DNAPL will not move with enough velocity in the low permeable soil to an area where we can recover it with our wells. This low permeable soil is one of the contributors that prevent recontamination of Fields Brook by the DNAPL.

Because we increase the velocity of the DNAPL with the vacuum, the silt does not have time to settle out and is pumped to the surface with the DNAPL. As described before, this vacuum enhancement causes the formation of crystals in the DNAPL.

A second idea is to put an individual pump in each well. This poses the same problem as we currently have, silt and crystals plugging pumps and filters. The silt and crystals would cause pumps to plug and the pumps would need to be cleaned constantly. If filters were to be installed ahead of the pumps, the filters would clog instantly, as we have experienced in the past. Even 100 micron filters plug instantly when the silt load is of sufficient quantity.

Where we have wells that have a high concentration of crystals of HBD, the pumps would clog instantly and that well would essentially be a useless well. We could not pump any DNAPL from a well that has a high concentration of crystals. Therefore, URS and Detrex have concluded that there are no good solutions for making the DNAPL extraction system operate efficiently. We have tried every measure we can think of to "tweak" the system to operate in a better and more consistent manner. It is technically impractical to operate the system in its current design and there are no known system designs that would operate at any better level of efficiency. For these reasons, URS and Detrex respectfully request the EPA to consider a Technical Impracticability Waiver.

Millennium $TiCl_4$ Plant Operable Unit
Five-Year Review Report
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Attachments:

Figure Millennium-1	**Map showing Historical Areas of Contamination**
Figure Millennium-2	**Map of $TiCl_4$ Facility Showing Extent of Soil Excavation In Mining Residual Pile**
Figure Millennium-3	**Map of $TiCl_4$ Facility Showing Extent of Soil Excavation in Plant Process Areas**
Correspondence	**2/4/03 letter from T. Van Donsel to R. Hughes regarding the frequency of monthly leachate analysis at the Millennium landfill.**
Correspondence	**2/5/01 letter from R. Hughes to T. Van Donsel - Results of monthly leachate analyses for calendar year 2000.**
Correspondence	**1/23/02 letter from R. Hughes to T. Van Donsel - Results of monthly leachate analyses for calendar year 2001.**
Correspondence	**1/22/03 letter from R. Hughes to T. Van Donsel - Results of monthly leachate analyses for calendar year 2002.**
Correspondence	**11/17/03 letter from R. Hughes to T. Van Donsel - Results of quarterly leachate analyses for calendar year 2003.**

List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
FSCA	Facility Stormwater Collection Area
HCB	Hexachlorobenzene
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ODH / BRP	Ohio Department of Health / Bureau of Radiation Protection
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
pCi/g	Pico-curies per gram
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
RMI	Reactive Metals Incorporated
$TiCl_4$	Titanium tetrachloride
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination problem at the Millennium $TiCl_4$ Plant Operable Unit of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the excavation of PCB and radium-contamination soil and mining residuals. The cleanup was performed from July to October 1999. Excavated soils and mining residuals were sent to Millennium's solid waste industrial landfill located within the Fields Brook watershed. No O&M was required at the $TiCl_4$ facility.

The assessment of this five-year review found that the remedy implemented for the Millennium $TiCl_4$ plant operable unit is functioning as designed. The scope of the cleanup was limited to actions necessary to protect Fields Brook from PCB and radium recontamination. The immediate and long-term threats to Fields Brook from contamination at the Millennium TiCl4 plant have been addressed and the remedy is protective of human health and the environment. O&M at the Millennium landfill is being performed in conjunction with Millennium's license requirements with the State of Ohio. Leachate monitoring results for PCBs and radium have been acceptable.

Five-Year Review Report
Millennium $TiCl_4$ Plant Source Control Operable Unit

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP, 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the Millennium TiCl4 Plant Source Control Operable Unit. The Ohio Environmental Protection Agency (OEPA) and the Ohio Department of Health Bureau of Radiation Protection provided support in the development of this five-year review.

This is the first five-year review for the Millennium TiCl4 Plant Operable Unit of the Fields Brook Site. The cleanup of the Millennium TiCl4 Plant was initiated in July of 1999 and completed in October of 1999. U.S. EPA issued a letter on June 28, 2000, approving the Completion of Remedial Action Report.

II. Site Chronology

Event	Date
$TiCl_4$ Plant constructed by Stauffer Chemical Company and began operations	1956
National Distillers and Chemicals bought and operated $TiCl_4$ Plant	1959
Cabot Titania purchased and began its operation of the $TiCl_4$ Plant	1963
$TiCl_4$ Plant leased to Gulf and Western Industries, Inc.	1972
Gulf and Western purchased the $TiCl_4$ Plant	1975
SCM purchased the $TiCl_4$ Plant	1983
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS.	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigated possible source control areas.	1992 – 1995
SCM changed its name to Millennium Inorganic Chemicals, Inc.	1997
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed 6 individual source control areas, including the Millennium $TiCl_4$ Plant	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the North Sewers RD/RA.	December 1997
Effective date of U.S. EPA "stop work" directive issued to Millennium to allow evaluation of project direction pending investigation of radionuclide contamination	June 10, 1998
U.S. EPA issued site-wide ESD to address radionuclide contamination at Millennium and in Fields Brook	April 8, 1999
U.S. EPA approved the Remedial Design and the Remedial Action Work Plan for the Millennium $TiCl_4$ Plant Operable Unit	July 21, 1999
Commencement of soil and mining residual excavation	July 26, 1999
Completion of excavation	October 15, 1999
U.S. EPA approved the Completion of Remedial Action Report	June 28, 2000
U.S. EPA approves reduction in PCB and radium monitoring frequency for leachate at the Millennium landfill. Leachate monitoring was reduced from monthly to quarterly.	February 4, 2003

III. Background

Physical Characteristics

Millennium Plant II, the $TiCl_4$ (titanium tetrachloride) facility, is located in the south-central portion of the industrialized area near Fields Brook. The structures currently at the site include several process buildings, a tank farm with numerous aboveground storage tanks contained entirely within a diked area, and three settling ponds. The western half of the property contains most of the process-related structures, whereas the eastern half remains largely undeveloped and is covered by a large pile of mining wastes and filter residue.

Land and Resource Use

The $TiCl_4$ plant was designed, constructed and initially operated by the Stauffer Chemical Company. Construction was completed in 1956. The facility was sold to National Distillers and Chemicals in 1959 and was operated for the next five years by National Distillers (and its affiliates Mallory-Sharon Metals and RMI Titanium). Cabot Titania acquired the plant in 1963 and operated it until 1972, when it was leased to Gulf and Western Industries, Inc. Gulf and Western purchased the plant in 1975. SCM purchased the $TiCl_4$ facility in 1983.

History of Contamination

At the commencement of operations at the $TiCl_4$ facility, the plant utilized a heat transfer system that used Aroclor-based fluids. This system remained in use until Gulf and Western had pure Aroclor removed from the heat transfer system in 1974 and replaced it with Monsanto PCB-Free Therminol.

Prior to Superfund involvement, there were multiple investigations of contamination at the $TiCl_4$ facility. A Toxic Substances Control Act (TSCA) action in 1983 led to the excavation and disposal of PCB-contaminated sediment from rainwater trenches (660 ppm) and overflow channels (330 ppm). In 1990, SCM identified the presence of PCB contamination (to 41,000 ppm) in plant area soils below the Therminol storage tank. This was reported to the Region V TSCA office. TSCA required the preparation of a work plan and an investigation to determine the extent of soil contamination and identify buried drums. This work was postponed in 1991, to allow coordination with the Fields Brook Source Control RI.

As part of the Source Control RI, the Recontamination Assessment of Millennium identified the Mining Residuals Pile, the Non-Traffic Area and the North Traffic Area as areas that possess the potential to recontaminate Fields Brook. At the consensus of U.S. EPA and Millennium, remedial action was also planned for other plant areas that have PCB concentrations greater than the Fields Brook cleanup goal. These additional areas include: the Laydown Area; the Plant Process Area; and the Existing Soil Piles. It should be noted that these three plant areas were analyzed by the Recontamination Assessment and were determined <u>not</u> to be potential sources of recontamination of Fields Brook. Descriptions of the six plant areas and analytical results are

summarized in the following sections. See Figure Millennium-1 for a facility diagram showing the various areas of historical contamination.

1. Non-Traffic

Site investigations identified PCBs in surface soils (approximately the upper 6 ft) in the west-central portion of the facility, extending north beyond the existing security fence-line. The area extending north beyond the fence-line to the 100-year floodplain is the Non-Traffic Area. PCB concentrations in surface soils in the Non-Traffic Area ranged from 3.1 ppm to 50 ppm. However, a few sampling locations near the old outfall were found to have concentrations of PCBs greater than 50 ppm, and some borings had soils containing greater than 500 ppm.

2. North Traffic Area

Site investigations identified PCBs in surface soils (approximately the upper 6 ft) in the west-central portion of the facility, extending north beyond the existing security fence-line. The area south of the fence-line and north of the Plant Process Area is defined as the North Traffic Area. The surface area in the North Traffic Area was covered with pavement, structures, or gravel. The gravel was placed to prevent further contact with on-site surface soils in this area and to reduce the potential for erosion of the surface soils.

PCB concentrations in surface soils in the North Traffic Area were identified in the range of 3.1 ppm to 50 ppm. However, a few sampling locations near an old outfall had concentrations of PCBs greater than 50 ppm and a small area with PCBs greater than 500 ppm.

3. Laydown Area

The Laydown Area was located immediately south of the concrete pad. The Laydown Area consisted of bare soils and vegetated soils. The average PCB concentration in the Laydown Area was 3.5 ppm, and the maximum concentration was 37.9 ppm (at 1.5 to 3.0 ft depth). The Recontamination Assessment found neither groundwater nor overland erosion to be complete pathways for recontamination of Fields Brook. The Laydown Area was to be addressed at the consensus of U.S. EPA and Millennium, but not because it had the potential to recontaminate Fields Brook.

4. Plant Process Area

The Plant Process Area was the active, operating portion of the $TiCl_4$ facility. The Plant Process Area is almost completely covered with either pavement or structures. PCB concentrations in surface soils in the Plant Process Area were identified in the range of 3.1 ppm to 50 ppm. However, a few scattered sampling locations have identified PCB concentrations greater than 50 ppm and a small area was found with PCB concentrations

greater than 500 ppm. The primary area with elevated PCB concentrations was associated with the old Therminol system.

5. Soil Piles

The Soil Piles were located on a concrete storage pad in the east central portion of the $TiCl_4$ facility. Standard plant maintenance and upgrades occasionally required the excavation of small amounts of soil. These soils were stockpiled on the concrete pad. Historic sampling results from the excavation locations indicate that some of these soils contained concentrations greater than 50 ppm PCBs. The soil piles were to be addressed at the consensus of U.S. EPA and Millennium; however, the soil piles were not designated as having the potential to recontaminate Fields Brook.

6. Mining Residuals Pile

The inactive Mining Residuals Pile was located in the eastern portion of the facility between Middle Road and Fields Brook. The pile received "Bevill" exempt mining residuals (e.g., iron hydroxide) from previous plant operations prior to Millennium's operations. As stated in the Bevill exemption, the mining residuals are neither hazardous wastes nor hazardous substances.

Information gathered during the Mining Residuals Pile investigation indicated that the MRP material was primarily iron hydroxide, with a low moisture content (measured at about 25 to 30 percent, as compared to an approximate field capacity of 50 to 60 percent), and a (disturbed) density ranging between 1.0 and 1.25 tons per cubic yard. Although the mining residuals were not hazardous wastes, sample results revealed that PCBs were present in the Mining Residuals Pile at concentrations ranging from non-detect to 760 ppm.

Initial Response

In 1989, the Fields Brook PRPs were issued a Unilateral Order to design a remedy for the Fields Brook sediments, complete a Remedial Investigation to identify the sources of contamination, and develop and evaluate cleanup alternatives for the sources of contamination. From 1992 to 1995, the PRPs evaluated 94 areas of potential contamination within the Fields Brook watershed to determine whether they were a source of past contamination or could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater.

As a result of this evaluation, the PRPs identified five industrial properties as sources of contamination to Fields Brook. The industrial properties include Detrex, Millennium Plant II $TiCl_4$ (formerly SCM), Acme Scrap Iron and Metal, RMI Metals, and Conrail. In addition, several sewer systems located to the north and south of Fields Brook were also found to be potential sources of contamination. Detailed information about the types and extent of

contamination at the source control operable units, including the Millennium $TiCl_4$ Plant, can be found in the Source Control Remedial Investigation (RI) reports. The final Phase 1 Source Control RI was approved in May of 1997.

In conjunction with the preparation of the Source Control Remedial Investigation report, the PRPs prepared a Source Control Feasibility Study to identify and evaluate cleanup alternatives. The Source Control Feasibility Study was finalized in June, 1997. The report described the initial screening of alternatives, the identification of a range of remedial alternatives, and the detailed analysis of the assembled alternatives for each of the five properties and the sewer systems.

Basis for Taking Action

The Source Control Remedial Investigation and Feasibility Study reports form the basis for U.S. EPA's cleanup strategy, as selected in the 1997 Source Control ROD. These reports have been included in the information repositories and the Administrative Record. The Source Control Remedial Investigation and Feasibility Study reports form the basis for U.S. EPA's cleanup strategy. These reports have been included in the information repositories and the Administrative Record.

IV. Remedial Actions

Remedy Selection

The cleanup of the Millennium $TiCl_4$ plant was developed to address contaminated soils and mining residual piles that were a source of PCBs and radionuclides to the brook. The September 29, 1997 Source Control ROD required the following actions for the Millennium operable unit:

- excavation of soil with PCB concentrations greater than or equal to 50 ppm.
- excavated soils to be disposed at either an on-site or off-site TSCA landfill.
- following completion of excavation activities, the excavated areas were to be backfilled with clean soil and graded to allow for adequate drainage.
- remaining surface soils included in the remedial response area were to be contained on-site with a 12-inch soil cover and an erosion control blanket and vegetated to reduce erosion. For traffic and work areas, a geotextile and 6 inches of gravel will be used.

When the Remedial Design for the cleanup of the Fields Brook sediment and the floodplain/wetland soils was approximately 90% complete stage, the U.S. EPA received information regarding possible radionuclide contamination in the Ashtabula River and the Fields Brook watershed. U.S. EPA issued a "stop work" directive to Millennium (effective June 10,

1998) to halt work on the Remedial Design under the Unilateral Administrative Order pending investigation of radionuclide contamination. U.S. EPA evaluated the available data and the site PRP, under U.S. EPA and Ohio Department of Health Bureau of Radiation Protection oversight, conducted follow-up sampling. The results of the sampling identified unacceptable levels of radium at the Millennium $TiCl_4$ facility and in floodplain/wetland soils near the Millennium facility. U.S. EPA determined that radium should be added as a contaminant of concern for the cleanup of the Millennium facility and for the Fields Brook sediment and the floodplain/wetland soils. Because of the presence of radium, specific components of the remedial action were modified to address soils and sediment that contain radium. The April 8, 1999 Site-Wide ESD made changes in both the Fields Brook and the Millennium TiCl4 property. The ESD required that soil and mining residuals be excavated from the Millennium $TiCl_4$ property to meet an industrial radium cleanup level of 10 pCi/g above backgrou[illegible]or combined levels of radium-226 and radium-228.

Remedy Implementation

Millennium utilized Morrison Knudson, Inc., to prepare the Remedial Design and perform construction management duties. Because of the presence of both PCBs and radionuclides, the Remedial Design was closely reviewed by U.S. EPA, USACE and the Ohio Department of Health Bureau of Radiation Protection (ODH/BRP). Millennium wanted to ensure that the property would be useable after cleanup and without restrictions; therefore, Millennium elected to exceed the requirements of the ROD and proposed the following:

- Excavation of soil and mining residuals containing ≥3.1 ppm total PCBs within the Mining Residual Pile or outside the Facility Stormwater Collection Area (FSCA).

- Excavation of soils containing ≥50 ppm total PCBs inside the FSCA.

- Excavation of soils containing total radium ≥ 12 pCi/g. The 12 pCi/g is based on 10 pCi/g above background, which is estimated at 1 pCi/g Ra-226 background and 1 pCi/g Ra-228 background.

- Site restoration

The Remedial Design and the Remedial Action work plan were approved on July 21, 1999.

Instead of waiting for use of the Fields Brook on-site landfill, Millennium had proposed to use its own landfill, which is part of the Millennium complex of facilities within the Fields Brook watershed. U.S. EPA evaluated the landfill, consulted with the Ohio EPA and the ODH/BRP, and made the determination that it meets the definition of "on-site" and that the construction of the landfill is consistent with the requirements of TSCA. As such, U.S. EPA allowed for the disposal of remediation-related material from the Millennium Source Control cleanup. From a radionuclide perspective, U.S. EPA and ODH/BRP observed that the current Millennium filtercake that is disposed in the landfill on a day-to-day basis (as part of normal operations)

contains elevated levels of radionuclides. U.S. EPA determined that the slightly higher concentrations of radionuclides in the remediation wastes did not warrant specialized disposal.

The physical cleanup at the Millennium $TiCl_4$ property began in July of 1999. U.S. EPA and ODH/BRP health physicists supplemented the oversight performed by the USACE. Approximately 700,000 cubic yards of PCB and radionuclide-contaminated soil was sent to the Millennium landfill for disposal. Because Millennium was exceeding the ROD-specified cleanup level for PCBs (implementing a 3.1 ppm cleanup instead of a 50 ppm cleanup for areas outside of the FSCA), U.S. EPA allowed Millennium to utilize PCB fields screening kits to supplement design estimates of the extent of contamination. This decision was based on the detection limit for the field screening kits and the presence of a clearly visible split between the underlying natural clays in the area and the soil / mining residual fill. PCB field screening results were periodically supplemented with lab verification samples to ensure that the field screening kits were providing results consistent with actual PCB concentrations.

Field screening using a sodium iodide detector was utilized in a similar manner to assist in field decisions concerning radionuclide contamination pending laboratory results for radium. However, because of the nature of radionuclide field screening, all verification samples were sent off-site for laboratory confirmation of radium levels. Verification results for radium showed that all grids except one met the residential standard for radium. The remaining grid met the industrial standard for radium.

The ROD cleanup requirements for the Millennium $TiCl_4$ plant were based on the current and anticipated future industrial land use. Millennium exceeded the ROD-required PCB and radium cleanups and expanded the cleanup to plant areas (within the FSCA) not deemed necessary under the ROD for the protection of Fields Brook.

Field work concluded in October 1999. Remedial Action excavation was officially completed with the approval of the Completion of Remedial Action Report on June 28, 2000.

System Operation/Operation and Maintenance

Millennium exceeded the requirements of the ROD and met a cleanup standard of 3.1 ppm total PCBs outside of the FSCA. This ensures that erosion off of the property will not cause an exceedance of the PCB cleanup goal (3.1 ppm) in the brook. For areas inside of the FSCA where there is not a concern (as long as the FSCA system is operating) that erosion could move PCB contamination to the brook, the 50 ppm total PCB cleanup standard was implemented. This is consistent with the PCB cleanup standard required in industrial areas of the floodplain that are directly adjacent to the brook. The areas within the FSCA where the 50 ppm cleanup standard was used are within the plant area and either paved or covered with a soil cover and gravel. Therefore, the FSCA and the cover provide an additional level of protectiveness. Based on the cleanup performed, U.S. EPA determined that no O&M was required at the $TiCl_4$ facility.

The Millennium landfill is still open and in operation. The facility is classified as a solid waste disposal facility and is permitted by the Ohio EPA. Millennium will continue to perform their permit-required monitoring and maintenance for Ohio EPA. However, PCBs and radionuclides have been added as parameters to their groundwater and leachate monitoring program, consistent with the August 1999 *Supplemental Monitoring Plan for MRP Disposal*. Copies of PCB and radionuclide monitoring results are provided to U.S. EPA for the site file. See the attached correspondence containing monthly and quarterly radium and PCB analytical results from leachate collected from the Millennium landfill.

On February 4, 2003, U.S. EPA approved a reduction in the monitoring of PCB and radium in the leachate at the Millennium landfill. Leachate monitoring was reduced from monthly to quarterly.

V. Progress Since the Last Five-Year Review

This is the first five-year review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA and Millennium were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Chuck McCracken, ODH/BRP
Richard Hughes, Millennium

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of this five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook. Because the only O&M data available for the Millennium OU relates to Millennium's permitted landfill which is under the jurisdiction of the Ohio EPA, it is unlikely that community interviews will be necessary for the Millennium OU.

Document Review/Data Review

The following documents were reviewed:

- Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997;
- Completion of Remedial Action Report, dated May 2000; and
- O&M Monitoring Results from the Millennium landfill (see attached correspondence containing radium and PCB analytical results from monthly and quarterly leachate samples).

A site inspection of the Fields Brook Site, including the RMI Metals property, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes, monitoring data collected to date confirms that the landfill is effectively containing contaminants present in the facility from the Millennium $TiCl_4$ Source Control cleanup.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes, there has been no change to the PCB or radium cleanup requirements for the facility. The Remedial Action Objectives for the Millennium $TiCl_4$ Property are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that would cause the Agency to question the protectiveness of the remedy in terms of recontamination to Fields Brook.

VIII. Issues

None.

IX. Recommendations and Follow-up Actions

Continue to review routine monitoring results from the Millennium landfill.

X. Protectiveness Statement

The remedy as implemented exceeded the requirements of the Source Control ROD and is protective of human health and the environment, in terms of preventing recontamination of Fields Brook in excess of the PCB and radium cleanup goals.

Although the source control remedial actions were not developed to address human health or ecological risks within each source control area, no human health or ecological concerns have been identified regarding the Millennium cleanup. The remedial action utilized a cleanup level of 3.1 ppm total PCBs for areas outside of the FSCA. PCB field screening kits were used in conjunction with periodic laboratory confirmation to verify the extent of necessary PCB excavation. The target cleanup level of 3.1 ppm total PCBs is acceptable for the current industrial land use. Within the FSCA, Millennium voluntarily addressed soils that had PCB contamination at or above 50 ppm total PCBs. As it is beyond of the scope of the Fields Brook source control cleanup, an evaluation was not performed to determine the adequacy of the 50 ppm total PCBs cleanup to address human health and ecological risk issues within the FSCA. In terms of radionuclide contamination, verification sampling showed that Millennium exceeded the radium cleanup level of 10 pCi/g above background. All grids met this industrial criterion, and all grids except for one met the residential radium cleanup level of 5 pCi/g above background.

XI. Next Review

The next five-year review for Fields Brook Superfund Site is required by June 2009, five years from the date of this review. At that time, O&M data from the Millennium landfill and conditions at the Millennium $TiCl_4$ Plant will be reviewed again as part of the overall Fields Brook review.

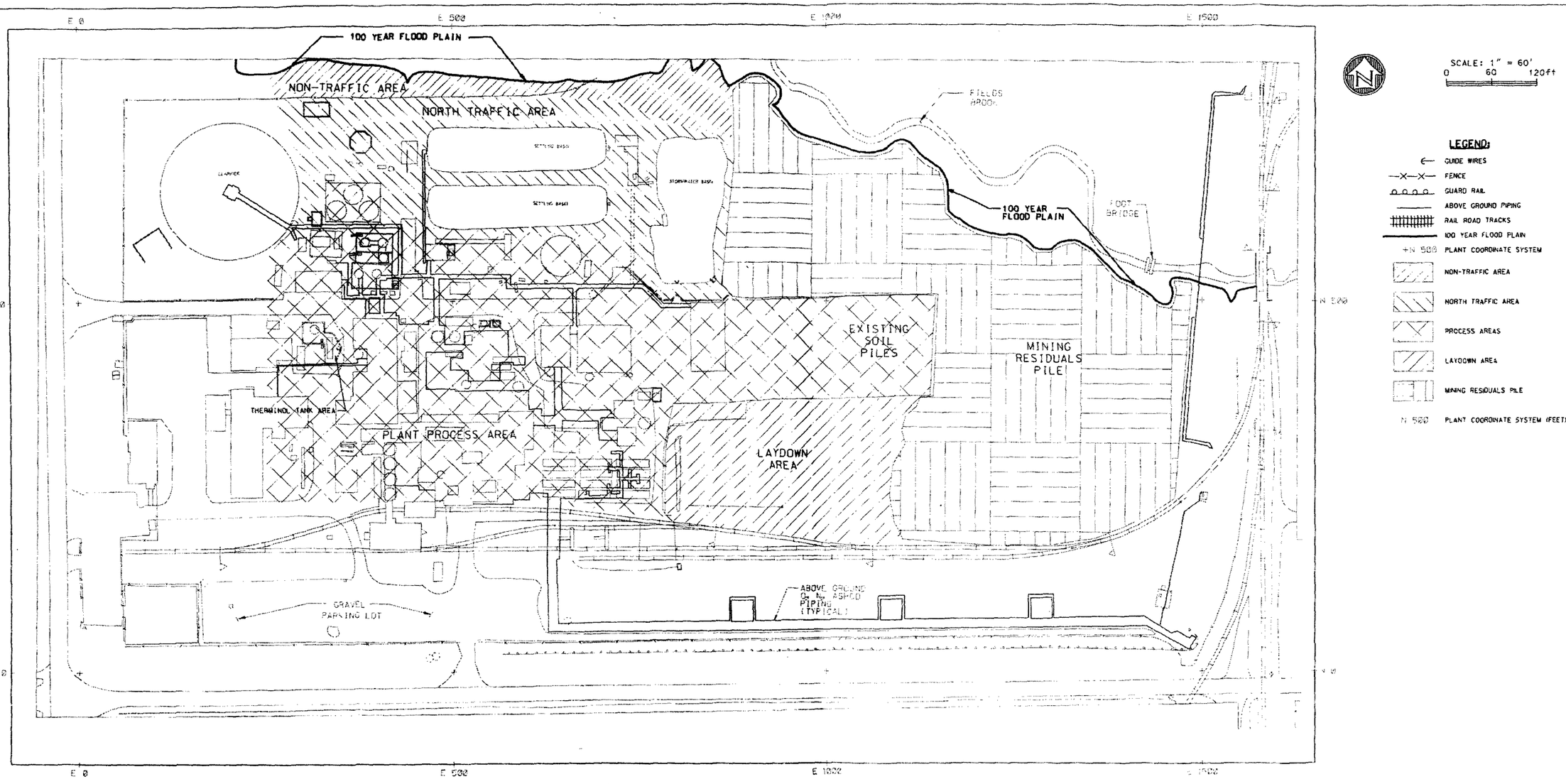


Figure Millennium-1

MILLENNIUM INORGANIC CHEMICALS INC.
ASHTABULA, OHIO

IDENTIFICATION OF PLANT AREAS

MIC PLANT 2 TiO2 FACILITY REMEDIAL DESIGN

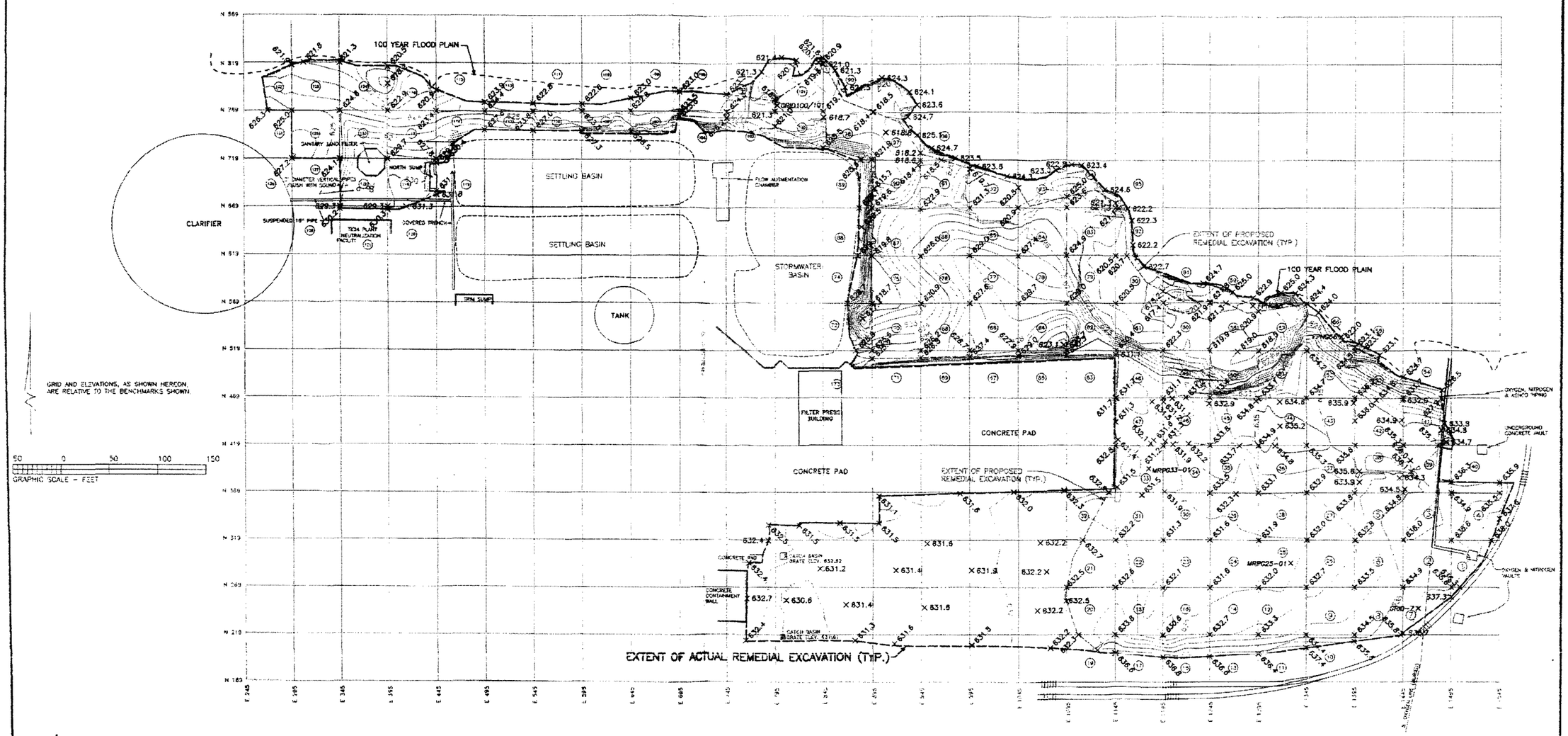
DESIGNED JO
DRAWN JF
CHECKED JO
APPROVED JK
RECOMMENDED JO

PROJECT NO. 4923-04

MORRISON KNUDSEN CORPORATION
ENGINEERING, CONSTRUCTION & ENVIRONMENTAL GROUP
MK-FERGUSON PLAZA
1500 WEST 3RD STREET
CLEVELAND, OHIO 44113-1406
(216) 523-5600

0 03/99 100% REMEDIAL DESIGN SUBMITTAL TO US E.P.A.
NO DATE REVISIONS

STATE ROUTE 11



GRID AND ELEVATIONS, AS SHOWN HEREON, ARE RELATIVE TO THE BENCHMARKS SHOWN.

50 0 50 100 150
GRAPHIC SCALE - FEET

MIDDLE ROAD

Figure Millennium-2

NOTES:

1.) TOPOGRAPHY AS SHOWN, WAS OBSERVED DURING ON-GOING REMEDIAL EXCAVATION FROM 07/21/99 THRU 10/29/99

2.) LOCATION OF 100 YEAR FLOOD PLAIN, AS DEPICTED HEREON, WAS PROVIDED BY MORRISON KNUDSEN CORPORATION.

3.) DESIGN EXCAVATION EXTENTS ARE IDENTIFIED ON DRAWING 4923-007 OF THE MILLENNIUM INORGANIC CHEMICALS PLANT CLTRL FACILITY, 100% REMEDIAL DESIGN DEVELOPED BY MORRISON KNUDSEN.

(12) EXCAVATION GRID NUMBER

STATE OF OHIO
Charles E. Sharp
7511
REGISTERED
PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S. #7511

MILLENNIUM INORGANIC CHEMICALS, INC.
ASHTABULA, OHIO

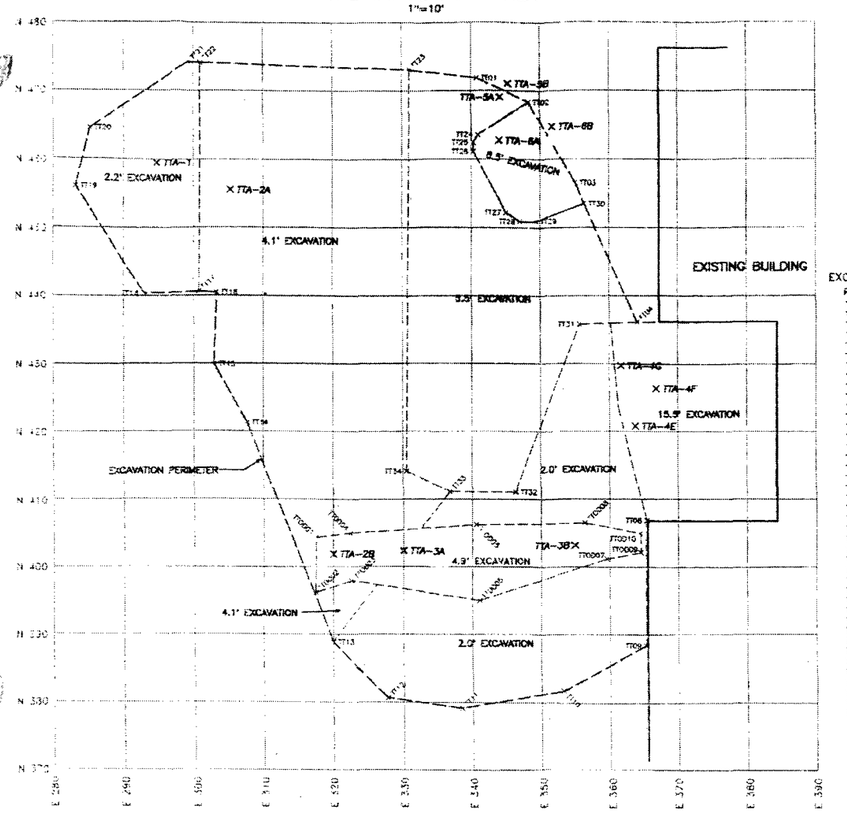
Scale	1"=50'	Revisions	Drawn by
Date	12/04/99		TDS

EXTENT OF REMEDIAL EXCAVATION
MINING RESIDUAL PILE

SHARP'S LAND SURVEYING
4111 STATE ROAD SOUTH, ASHTABULA, OHIO
216 992-2874 1-800-922-1051

DWG. NO. 4923-107

THERMINOL TANK AREA
1"=10'



THERMINOL TANK AREA
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
TT01	471.9	340.8
TT02	468.4	348.4
TT03	456.5	355.1
TT04	436.1	364.1
TT08	406.9	365.4
TT09	388.4	363.3
TT10	381.8	353.2
TT11	379.2	336.4
TT12	380.7	327.7
TT13	388.9	320.0
TT14	421.3	307.6
TT15	429.9	302.8
TT16	440.5	303.2
TT17	440.6	300.8
TT18	440.4	292.8
TT19	456.0	283.1
TT20	464.5	285.1
TT21	474.2	299.2
TT22	474.2	300.9
TT23	473.1	331.1
TT24	462.6	341.0
TT25	462.4	340.3
TT26	461.1	340.3
TT27	452.2	345.1
TT28	450.9	347.1
TT29	450.9	349.4
TT30	453.4	356.4
TT31	435.8	355.7
TT32	411.1	346.3
TT33	411.1	336.7
TT34	414.1	330.5
TT0001	494.3	317.5
TT0002	486.2	317.4
TT0003	398.3	322.7
TT0004	405.0	322.6
TT0005	395.0	341.0
TT0006	406.2	340.6
TT0007	401.2	359.5
TT0008	406.4	356.4
TT0009	402.1	364.9
TT0010	404.3	364.5

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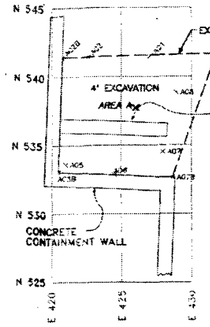

AREA "A"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
A01	541.5	427.1
A02	541.4	422.6
A02B	541.4	420.8
A03	533.6	421.0
A03B	533.0	420.5
A04	532.8	424.5
A04B	534.5	427.9
A05	532.6	428.8
A06	538.8	428.3
A06B	541.7	431.8

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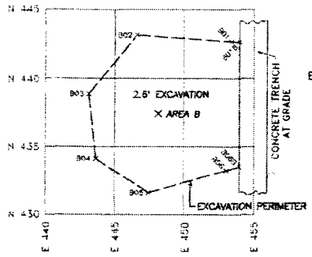

AREA "B"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
B01	442.7	453.4
B01B	442.6	454.3
B02	443.1	446.6
B03	438.9	443.1
B04	434.1	443.7
B05	431.6	447.4
B06	433.3	453.6
B06B	433.8	454.0

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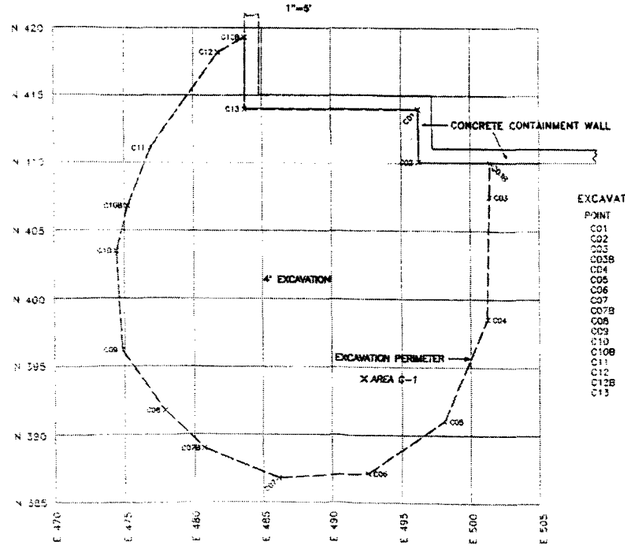
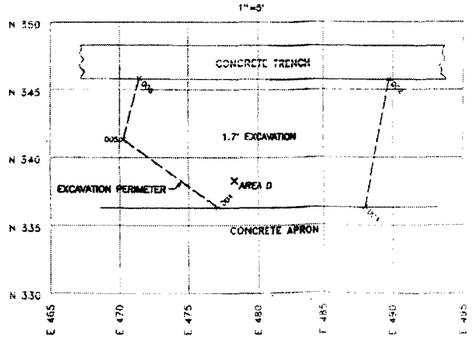


AREA "C"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
C01	414.0	496.2
C02	410.1	496.2
C03	407.5	501.4
C03B	410.1	501.4
C04	398.5	501.2
C05	391.1	498.1
C06	387.2	492.5
C07	386.8	486.1
C07B	388.0	480.7
C08	391.8	477.9
C09	396.2	474.8
C10	403.5	474.4
C10B	406.8	475.2
C11	411.1	478.9
C12	418.2	481.8
C12B	419.3	483.8
C13	414.0	483.7

AREA "D"
1"=5'

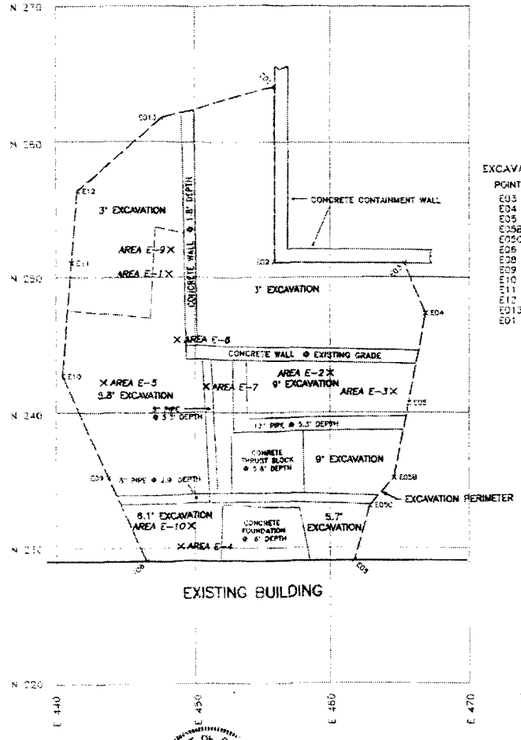


AREA "D"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
D02	345.1	469.7
D03	336.3	468.6
D04	336.3	477.1
D05	341.3	470.3
D06	345.8	471.4

NOTE: DESIGN EXCAVATION EXTENTS ARE IDENTIFIED ON DRAWING 4923-008 OF THE MILLENNIUM INORGANIC CHEMICALS PLANT 2, TICLA FACILITY. 100% REMEDIAL DESIGN DEVELOPED BY MORRISON KNUDSEN.

AREA "E"
1"=5'



AREA "E"
EXCAVATION POINT COORDINATES

POINT	NORTHING	EASTING
E03	251.0	465.3
E04	247.5	466.9
E05	240.7	465.6
E05B	235.2	454.4
E05C	233.1	462.9
E06	229.0	461.7
E08	229.0	446.5
E09	235.2	443.8
E10	242.7	440.5
E11	251.1	441.1
E12	256.4	441.5
E013	261.8	447.7
E01	264.0	455.9

Figure Millennium-3

STATE OF OHIO
Charles E. Sharp
7510
REGISTERED PROFESSIONAL SURVEYOR

CHARLES E. SHARP, P.S. #7510

MILLENNIUM INORGANIC CHEMICALS, INC.
ASHTABULA, OHIO

Scale	VARIES	Revisions	Drawn by
Date	12/07/99		CES

EXTENT OF REMEDIAL EXCAVATION
PLANT PROCESS AREAS

SHARP'S LAND SURVEYING
4141 STATE ROAD NORTH, ASHTABULA, OHIO
216-992-5478 1-800-322-4854

CWC NO. 4923-108

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR-6J

February 4, 2003

Mr. Richard Hughes
Environmental Superintendent
Millennium Chemicals
Ashtabula Complex
2900 Middle Road
P.O. Box 310
Ashtabula, Ohio 44004

RE: Frequency of Monthly Leachate Analysis at the Millennium Ashtabula Landfill

Dear Mr. Hughes:

The U.S. EPA has reviewed the leachate monitoring results for the Millennium Ashtabula Landfill and has evaluated your request to reduce the frequency of leachate monitoring. I have consulted with Mr. Colum McKenna of Ohio EPA/NEDO and Mr. Chuck McCracken of ODH on this issue and agree with your request for a reduction in the frequency of monitoring. From this time forward, leachate monitoring shall be on a quarterly basis.

Correspondence from U.S. EPA regarding monitoring at the Millennium Ashtabula landfill relates to the evaluation Superfund materials placed in the cell and in no way overrides monitoring requirements established by your permit. Please review your permit to ensure that you are meeting all Ohio EPA requirements.

If you have any questions or concerns, please let me know. I can be reached at 312-353-6564.

Sincerely,

Terese A. Van Donsel
Project Manager

cc: P. Felitti, ORC
C. McKenna, OEPA/NEDO
C. McCracken, ODH
Site File

Millennium
Inorganic Chemicals

Americas – Ashtabula Complex, Plant I
2900 Middle Road
P.O. Box 310
Ashtabula, Ohio 44004
Tel. 440-994-1473
Fax 440-994-1608

Ms. Terese Van Donsel
Remedial Project Mgr.
Remedial and Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, Ill. 60604

Feb. 5, 2001

Subject: Millennium Ashtabula Landfill Monthly Leachate Analysis for 2000

Dear Ms. Van Donsel;

Enclosed is the summary of the monthly leachate analysis taken at the Millennium Ashtabula Landfill for calendar year 2000, in accordance with the conditions set forth in the April 8, 1998 letter from USEPA.

If you have any comments or questions, do not hesitiate to contact me at 440-994-1721.

Sincerely,

Richard Hughes
Environmental Superintendent

Cc:

Colum McKenna – OEPA, NEDO
Chuck McCracken – ODH
T. Cudak

MAL Leachate

Date Collected		1/11/00	2/15/00	3/22/00 3/29/00	4/11/00	5/23/00	6/21/00	7/13/00	8/17/00	9/12/00	10/12/00	11/8/00	12/19/00
Analyte	**Units**												
Alkalinity, Total (CaC03)	mg/L	32	21	26	27	31	32	30	24	36	32	20	26
Chloride	mg/L	11000	12100	11900	10700	10500	12100	10800	14000	11900	10900	12700	10300
COD	mg/L	1240	370	884	22	620	788	490	400	721	625	984	727
Conductivity	umhos/cm	19100											
Nitrogen, Ammonia Direct	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen, Nitrate+Nitrite	mg/L	0.17	0.3	<0.02	<0.02	0.14	0.16	0.15	0.19	0.15	0.09	0.23	0.06
pH (Lab)	S.U.	6.61											
Solids, Total Dissolved	mg/L	17700	17740	17300	17200	18100	17700	19400	17200	19800	19800	21000	16400
Solids, Suspended	mg/L	9	<3	8	7	<3	4	14	11	4	<3	10	<3
Sulfate	mg/L	750	617	762	854	1340	704	773	700	795	991	865	1060
Turbidity	NTU	2.32	1.35	1.81	<1	<1	<1	<1	<1	<1	<1	<1	<1
Radon by Scintillation (SUB)	pCi/L	340(+-50)	430(+-30)	460(+-30)	700(+-40)	200(+-20)	490(+-30)	230(+-20)	340(+-30)	340(+-24)	480(+-35)	9700(+-100	960 (+-37)
Radium 226	pCi/L	1.9(+-2.2)	0.9(+-1.9)	1.9(+-3.0)	2.9(+-1.7)	0.7(+-1.8)	1.8(+-3.4)	0.0(+-2.2)	1.6(+-1.8)	0.2(+-1.2)	0.7(+-3.0)	1.7(+-2.6)	2.4 (+-2.9)
Radium 228	pCi/L	0.4(+-3.4)	4.4(+-7.1)	0.0(+-3.4)	6.2(+-8.8)	4.1(+-7.4)	0.0(+-5.8)	1.7(+-7.8)	2.4(+-8.2)	5.2(+-6.8)	4.2(+-7.9)	1.8(+-9.4)	1.4 (+-5.3)
VOLATILE COMPOUNDS - 8260													
Acetone	ug/L	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Acrolein	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Acrylonitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Allyl chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Carbon disulfide	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane (EDB)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,4-Dichloro-2-butene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

MAL Leachate

Date Collected		1/11/00	2/15/00	3/22/00 3/29/00	4/11/00	5/23/00	6/21/00	7/13/00	8/17/00	9/12/00	10/12/00	11/8/00	12/19/00
Analyte	**Units**												
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Iodomethane (Methyl Iodide)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methacrylonitrile	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Methyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BASE NEUTRAL COMP. 8270													
Hexachlorobenzene	ug/L	<10	<11	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
PCBs, M 8080													
Aroclor 1016	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1221	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1232	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1242	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1248	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1254	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1260	ug/L	<0.20	<0.20	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
VOLATILES - 504.1													
1,2-Dibromo-3-chloropropane	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylene dibromide	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony, Diss, ICPMS	mg/L	<0.0100	<0.0060	<0.0060	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic, Dissolved, ICPMS	mg/L	<0.010	<0.0050	<0.0050	<0.005	<0.010	<0.010	<0.080	<0.010	<0.020	<0.010	<0.020	<0.020
Barium, Dissolved, ICP	mg/L	0.272	0.258	0.27	0.16	0.19	0.238	0.212	0.24	0.226	0.16	0.2	0.12
Beryllium, DISS, ICPMS	mg/L	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

MAL Leachate

Date Collected		1/11/00	2/15/00	3/22/00 3/29/00	4/11/00	5/23/00	6/21/00	7/13/00	8/17/00	9/12/00	10/12/00	11/8/00	12/19/00
Lead, Diss, ICPMS	mg/L	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium, Dissolved, ICP	mg/L	926	920	1040	1190	1070	884	912	788	978	1020	915	1110
Manganese, Dissolved, ICP	mg/L	11.8	15.2	13.4	12.9	12	14.6	12.7	14.2	14.4	14.7	12	12.3
Nickel, Dissolved, ICP	mg/L	<0.030	<0.020	<0.03	0.026	0.03	0.022	0.02	<0.040	<0.020	<0.020	<0.050	0.02
Potassium, Dissolved, ICP	mg/L	21.6	20.6	21.6	18.6	19.8	23.6	22.8	21.4	25.6	19.7	24.1	18.4
Selenium, Dissolved, GFAA	mg/L	<0.250	<0.500	<0.0100	0.023	<0.010	<0.050	<0.010	<0.050	<0.050	<0.025	<0.400	<0.050
Silver, Dissolved, ICP	mg/L	<0.080	<0.080	<0.12	<0.080	<0.080	<0.080	<0.080	<0.16	<0.080	<0.080	<0.20	<0.080
Sodium, Diss, ICP	mg/L	1060	1010	1060	935	924	1060	980	948	1110	878	1100	814
Thallium, Diss, ICPMS	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002	<0.004	<0.002	<0.004	<0.004
Vanadium, Dissolved, ICP	mg/L	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.25	<0.10
Zinc, Dissolved, ICP	mg/L	<0.10	<0.10	<0.15	<0.10	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10	<0.25	<0.10

Ms. Terese Van Donsel
Remedial Project Mgr.
Remedial and Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, Ill. 60604

Jan. 23, 2002

Subject: Millennium Ashtabula Landfill Monthly Leachate Analysis for 2001

Dear Ms. Van Donsel;

Enclosed is the summary of the monthly leachate analysis taken at the Millennium Ashtabula Landfill for calendar year 2001, in accordance with the conditions set forth in the April 8, 1998 letter from USEPA.

The dates and tests in blue text go together. For those months there was a need to do an additional sample collection due to sample receipt deficiencies either due to holding times or cooler receipt temperatures.

Millennium has been sampling the leachate monthly since May 1999. In that time there has not been one instance of PCB's in the leachate above the detection limit. Millennium requests reducing the frequency of sampling to quarterly given the consistency that the data shows.

If you have any comments or questions, do not hesitiate to contact me at 440-994-1721.

Sincerely,

Richard Hughes
Environmental Superintendent

Cc:

Colum McKenna – OEPA, NEDO
Chuck McCracken – ODH
T. Cudak

MAL Leachate 2001

Analyte	Units	1/16/2001	2/7/2001	3/14/2001 3/27/2001	4/18/2001	5/9/2001	6/13/2001	7/18/2001	8/29/2001	9/19/2001	10/24/2001 10/31/2001	11/21/2001 11/28/2001	12/12/2001 12/26/2001
Alkalinity, Total (CaC03)	mg/L	22	19	23	16	18	<10	18	24	24	28	28	25
Chloride	mg/L	9340	10,500	9,800	10,300	12,900	12,600	15,500	11,800	12,800	12,400	10,700	9,360
COD	mg/L	440	801	512	415	816	656	499	593	598	896	564	381
Conductivity	umhos/cm			15,700									
Nitrogen, Ammonia Direct	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
Nitrogen, Nitrate+Nitrite	mg/L	0.17	0.12	0.14	0.19	0.26	0.25	0.19	0.19	0.16	0.06	0.12	0.08
pH (Lab)	SU			6.73									
Solids, Total Dissolved	mg/L	13900	16,900	4,500	18,300	21,100	19,500	21,400	20,500	20,500	19,000	16,400	14,400
Solids, Suspended	mg/L	7	7	<3	14	16	16	8	9	21	8	13	12
Sulfate	mg/L	855	905	865	770	870	885	835	942	825	950	914	818
Turbidity	NTU	<1	<1	<1	<1	<1	1.11	<1	<1	<1	<1	<1	<1
Radon by Scintillation (SUB)	pCi/L	700(+-36)	430(+-30)	430(+-30)	570(+-30)	390(+-26)	280(+-21)	390(+-25)	490(+-30)	530(+-30)	550(+-30)	540(+-30)	530(+-30)
Radium 226	pCi/L	4.3(+-2.9)	0.0(+-3.5)	0.0(+-3.6)	0.0(+-2.6)	0.8(+-2.5)	1.5(+-2.6)	1.0(+-2.0)	1.8(+-2.3)	2.3(+-2.7)	2.1(+-2.5)	1.0(+-1.2)	1.1(+-1.7)
Radium 228	pCi/L	4.1(+-7.1)	0.0(+-7.7)	0.8(+-8.4)	3.5(+-8.2)	3.3(+-7.2)	0.0(+-5.6)	2.1(+-7.8)	0.0(+-8.1)	1.3(+-6.9)	3.4(+-8.3)	0.0(+-8.1)	8.9(+-8.3)
VOLATILE COMPOUNDS - 8260													
Acetone	ug/L	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
Acrolein	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Acrylonitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Allyl chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Carbon disulfide	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chloroprene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane (EDB)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,4-Dichloro-2-butene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

		1/16/2001	2/7/2001	3/14/2001 3/27/2001	4/18/2001	5/9/2001	6/13/2001	7/18/2001	8/29/2001	9/19/2001	10/24/2001 10/31/2001	11/21/2001 11/28/2001	12/12/2001 12/26/2001
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Iodomethane (Methyl Iodide)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methacrylonitrile	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
Methyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.2	<5.0	<5.0
Vinyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BASE NEUTRAL COMP. 8270													
Hexachlorobenzene	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
PCBs, M 8080													
Aroclor 1016	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1221	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1232	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1242	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1248	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1254	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1260	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
VOLATILES - 504.1													
1,2-Dibromo-3-chloropropane	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
		1/16/2001	2/7/2001	3/14/2001	4/18/2001	5/9/2001	6/13/2001	7/18/2001	8/29/2001	9/19/2001	10/24/2001	11/21/2001	12/12/2001

				3/27/2001							10/31/2001	11/28/2001	12/26/2001
Ethylene dibromide	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony, ICPMS	mg/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic, ICPMS	mg/L	<0.020	<0.02	<0.020	<0.020	<0.02	<0.020	<0.040	<0.040	<0.020	<0.020	<0.020	<0.020
Barium, ICP	mg/L	0.14	0.13	0.1	0.18	0.22	0.21	0.24	0.2	0.18	0.12	0.13	0.091
Beryllium, ICPMS	mg/L	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cadmium, ICPMS	mg/L	<0.0040	<0.0040	<0.0040	<0.0040	<0.0020	<0.0010	<0.004	<0.010	<0.004	<0.0040	<0.005	<0.0040
Calcium, ICP	mg/L	2900	3,410	2,760	3,580	4,180	3,960	3,480	4,120	4,200	3,270	3,360	3490
Chromium, ICPMS	mg/L	0.0678	0.0501	0.0579	0.0521	<0.020	0.0402	<0.020	<0.050	<0.020	<0.080	0.0745	0.0903
Cobalt, ICPMS	mg/L	0.0068	0.0075	0.0062	0.0078	<0.005	<0.0050	0.0082	0.0107	0.0095	0.01	0.0091	0.0095
Copper, ICP	mg/L	<0.040	<0.040	<0.040	<0.10	<0.10	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.080
Iron, ICP	mg/L	<0.20	<0.20	<0.20	<0.50	<0.50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.40
Lead, ICPMS	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium, ICP	mg/L	954	898	896	940	930	921	1,160	1,160	1,100	1,070	912	1050
Manganese, ICP	mg/L	10.7	15.6	9.44	12.6	13	12.4	17.6	16.7	18.4	23.3	16	14.8
Nickel, ICP	mg/L	<0.020	<0.020	<0.020	<0.050	<0.050	0.03	0.045	<0.030	<0.03	<0.030	<0.030	<0.040
Potassium, ICP	mg/L	18.1	18	16.1	20.4	22.6	23.3	27.4	26.1	23	20	17.9	23
Selenium, GFAA	mg/L	<0.050	<0.0250	0.0563	<0.050	<0.200	<0.010	<0.100	<0.010	<0.0050	<0.0050	<0.125	<0.050
Silver, ICP	mg/L	<0.080	<0.080	<0.080	<0.20	<0.20	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.160
Sodium, ICP	mg/L	750	824	684	860	1,020	1,090	1,110	1,110	975	840	759	865
Thallium, ICPMS	mg/L	<0.002	<0.004	<0.004	<0.004	<0.004	<0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Vanadium, ICP	mg/L	<0.10	<0.10	<0.10	<0.25	<0.25	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.20
Zinc, ICP	mg/L	<0.10	<0.10	<0.10	<0.25	<0.25	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15

Millennium Chemicals

Ashtabula Complex
2900 Middle Road
P.O. Box 310
Ashtabula, Ohio 44004

Ms. Terese Van Donsel
Remedial Project Mgr.
Remedial and Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, Ill. 60604

Jan. 22, 2003

Subject: Millennium Ashtabula Landfill Monthly Leachate Analysis for 2002

Dear Ms. Van Donsel;

Enclosed is the summary of the monthly leachate analysis taken at the Millennium Ashtabula Landfill for calendar year 2002, in accordance with the conditions set forth in the April 8, 1998 letter from USEPA.

Millennium has been sampling the leachate, monthly, since May 1999. In that time there has not been one instance of PCB's in the leachate above the detection limit. Millennium requests, for the *second time*, reducing the frequency of sampling to quarterly given the consistency that the data shows.

If you have any comments or questions, do not hesitiate to contact me at 440-994-1721.

Sincerely,

Richard Hughes
Environmental Superintendent

Cc:

Colum McKenna – OEPA, NEDO
Chuck McCracken – ODH
T. Cudak

MAL Leachate 2002

Date Collected		1/23/02	2/20/02	3/13/02	4/17/02	5/21/02	6/18/02 6/26/02	7/29/02	8/26/02 8/29/02	9/18/02	10/28/02	11/14/02	12/12/02
Analyte	**Units**												
Alkalinity, Total (CaC03)	mg/L	22	21	20	26	22	22	17	23	26	27	20	21
Chloride	mg/L	11,100	11,400	10,900	10,400	10,800	10,500	12,200	13,100	11,600	11,500	12,500	11,600
COD	mg/L	531	670	644	598	921	793	553	836	135	789	480	732
Conductivity	umhos/cm												
Nitrogen, Ammonia Direct	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrogen, Nitrate+Nitrite	mg/L	0.17	0.2	0.2	0.11	0.1	0.17	0.12	0.18	0.12	0.19	0.22	0.22
pH (Lab)	SU												
Solids, Total Dissolved	mg/L	19,400	18,800	18,900	17,100	16,000	19,300	22,700	17,000	24,000	16,400	19,200	18,000
Solids, Suspended	mg/L	12	9	12	9	14	15	15	12	12	10	17	15
Sulfate	mg/L	809	968	886	927	1,060	9[illegible]7	954	842	867	904	929	850
Turbidity	NTU	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Radon by Scintillation (SUB)	pCi/L	550(+-30)	520(+-30)	540(+-30)	620(+-30)	490(+-30)	560(+-30	410(+-30)	440(+-30)	690(+-50)	530(+-30)	510(+-25)	440(+-20)
Radium 226	pCi/L	0.2(+-1.1)	1.9(+-1.1)	0.3(+-1.8)	0.6(+-1.1)	0.3(+-2.2)	1.4(+-1.1)	1.6(+-1.9)	1.6(+-2.2)	0.6(+-2.4)	1.5(+-1.2)	0.5(+-1.3)	0.6(+-1.1)
Radium 228	pCi/L	3.9(+-8.3)	0.5(+-5.2)	3.1(+-6.5)	0.3(+-5.5)	0.0(+-9.1)	1.8(+-4.6)	0.0(+-6.9)	0.0(+-7.0)	0.0(+-5.8)	2.9(+-5.4	1.0(+-5.2)	1.7(+-9.2)
VOLATILE COMPOUNDS - 8260													
Acetone	ug/L	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<100	<20.0	<20.0	<20.0	<20.0
Acrolein	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<250	<50.0	<50.0	<50.0	<50.0
Acrylonitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<250	<50.0	<50.0	<50.0	<50.0
Allyl chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<62.5	<12.5	<12.5	<12.5	<12.5
Carbon disulfide	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Chloroprene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane (EDB)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
trans-1,4-Dichloro-2-butene	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0

cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Ethyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<62.5	<12.5	<12.5	<12.5	<12.5
Iodomethane (Methyl Iodide)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Methacrylonitrile	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<62.5	<12.5	<12.5	<12.5	<12.5
Methyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<250	<50.0	<50.0	<50.0	<50.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Vinyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<25	<5.0	<5.0	<5.0	<5.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<1.0
BASE NEUTRAL COMP. 8270													
Hexachlorobenzene	ug/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
PCBs, M 8080													
Aroclor 1016	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1221	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1232	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1242	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1248	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1254	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aroclor 1260	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
VOLATILES - 504.1													
1,2-Dibromo-3-chloropropane	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylene dibromide	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Antimony, ICPMS	mg/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.010	<0.0060	<0.0060
Arsenic, ICPMS	mg/L	<0.020	<0.040	<0.020	<0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0200	<0.020	<0.020
Barium, ICP	mg/L	0.15	<0.080	<0.080	<0.080	<0.100	0.1	0.11	0.16	0.1	<0.500	0.12	0.1
Beryllium, ICPMS	mg/L	<0.004	<0.0040	<0.0040	<0.005	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Cadmium, ICPMS	mg/L	<0.0020	<0.0040	<0.004	<0.005	<0.0040	<0.004	<0.0040	<0.004	<0.004	<0.0040	<0.004	<0.0040
Calcium, ICP	mg/L	3,660	3700	3,500	2,990	3,440	3,880	3,690	4,380	3,610	3,860	3,930	4,240
Chromium, ICPMS	mg/L	0.111	0.104	0.135	0.217	0.166	0.093	0.114	0.0485	0.111	0.107	0.0714	0.098
Cobalt, ICPMS	mg/L	0.0085	0.0084	0.0122	0.0121	0.0108	0.0083	0.0115	0.0097	0.0084	0.0102	0.009	0.0121
Copper, ICP	mg/L	<0.060	<0.040	<0.080	<0.040	<0.100	<0.10	<0.060	<0.060	<0.080	<0.100	<0.060	<0.080
Iron, ICP	mg/L	<0.30	<0.20	<0.40	<0.200	<0.50	<0.50	0.41	<0.30	<0.40	<0.500	<0.30	<0.40
Lead, ICPMS	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium, ICP	mg/L	1120	1100	1,060	1,170	1,210	1,170	1,210	1,230	1,250	1,090	1,160	1,200
Manganese, ICP	mg/L	14.2	12	12.5	13.2	11	10.2	19.4	18	20.4	15.7	16.9	13.5
Nickel, ICP	mg/L	<0.030	0.026	<0.030	<0.030	<0.03	<0.050	<0.03	<0.030	<0.040	<0.040	<0.030	<0.040
Potassium, ICP	mg/L	19.9	27	28.9	22	21.7	20.6	20	24.1	20.5	26.5	24.7	23.9
Selenium, GFAA	mg/L	<0.0050	<0.050	<0.0050	<0.0050	<0.025	0.0068	0.0172	0.0079	<0.0050	<0.050	<0.080	<0.0050
Silver, ICP	mg/L	<0.12	<0.080	<0.160	<0.080	<0.12	<0.20	<0.12	<0.12	<0.16	<0.200	<0.12	<0.16
Sodium, ICP	mg/L	879	1020	943	864	879	890	909	1,070	908	1,030	1,040	996
Thallium, ICPMS	mg/L	0.002	<0.0040	<0.004	<0.005	<0.004	<0.004	<0.004	0.004	0.006	<0.004	<0.004	<0.004
Vanadium, ICP	mg/L	<0.15	<0.100	<0.200	<0.100	<0.250	<0.25	<0.15	<0.15	<0.20	<0.250	<0.15	<0.20
Zinc, ICP	mg/L	<0.15	<0.100	<0.200	<0.100	<0.250	<0.25	<0.15	<0.15	<0.20	<0.250	<0.15	<0.20

Notes:

Sampling Date 01/23/02: The result for TDS highlighted in red text should be considered an estimated number. Due to analytical problems with the initial analysis, no data could be provided. The sample was re-analyzed outside of the holding time established for this analysis and that is the data reported.

Millennium
Inorganic Chemicals

Americas – Ashtabula Complex, Plant I
2900 Middle Road
P.O. Box 310
Ashtabula, Ohio 44004
Tel. 440-994-1400
Fax 440-994-1603

Ms. Terese Van Donsel
Remedial Project Mgr.
Remedial and Enforcement Response Branch
USEPA Region V
77 West Jackson Blvd.
Chicago, Ill. 60604

Nov. 17, 2003

Subject: Millennium Ashtabula Landfill Quarterly Leachate Analysis for 2003

Dear Ms. Van Donsel;

Enclosed is the summary of the Quarterly leachate analysis taken at the Millennium Ashtabula Landfill for calendar year 2003, in accordance with the conditions set forth in the April 8, 1998 letter from USEPA.

Millennium has been sampling the leachate, monthly, since May 1999, and quarterly in 2003. In that time there has not been one instance of PCB's in the leachate above the detection limit. Millennium received approval to change the leachate sampling frequency to quarterly by letter from you on Feb. 4, 2003.
If you have any comments or questions, do not hesitiate to contact me at 440-994-1721.

Sincerely,

Richard Hughes
Environmental Superintendent

Cc:

Colum McKenna – OEPA, NEDO
Chuck McCracken – ODH
J. Norris

MAL Leachate 2003

Date Collected		1/8/03	4/9/03	7/24/03 7/9/03	10/8/03
Analyte	**Units**				
Alkalinity, Total (CaC03)	mg/L	21	20	21	21
Chloride	mg/L	11,600	9,910	11,100	13,000
COD	mg/L	570	344	894	833
Conductivity	umhos/cm				
Nitrogen, Ammonia Direct	mg/L	<0.02	<0.02	<0.02	<0.02
Nitrogen, Nitrate+Nitrite	mg/L	0.15	0.15	0.15	0.18
pH (Lab)	SU				
Solids, Total Dissolved	mg/L	18,600	20,200	18,200	20,000
Solids, Suspended	mg/L	8	11	9	10
Sulfate	mg/L	1,140	1,150	1,020	1,010
Turbidity	NTU	<1	<1	<1	<1
Radon by Scintillation (SUB)	pCi/L	660(+-30)	720(+-33)	530(+-30)	590(+-30)
Radium 226	pCi/L	1.6(+-2.2)	0.8(+-2.1)	0.3(+-2.7)	1.7(+-2.5)
Radium 228	pCi/L	0.0(+-5.4)	5.2(+-4.9)	0.3(+-4.6)	2.2(+-5.2)
VOLATILE COMPOUNDS - 8260					
Acetone	ug/L	<20.0	<20.0	<20.0	<20.0
Acrolein	ug/L	<50.0	<50.0	<50.0	<50.0
Acrylonitrile	ug/L	<50.0	<50.0	<50.0	<50.0
Allyl chloride	ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0
2-Butanone (MEK)	ug/L	<12.5	<12.5	<12.5	<12.5
Carbon disulfide	ug/L	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
Chloroethane	ug/L	<5.0	<5.0	<5.0	<5.0
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0
Chloromethane	ug/L	<5.0	<5.0	<5.0	<5.0
Chloroprene	ug/L	<5.0	<5.0	<5.0	<5.0
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0

Date Collected		1/8/03	4/9/03	7/24/03 7/9/03	10/8/03
Analyte	**Units**				
Dibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/L	<5.0	<5.0	<5.0	<5.0
1,2-Dibromoethane (EDB)	ug/L	<5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0
trans-1,4-Dichloro-2-butene	ug/L	<5.0	<5.0	<5.0	<5.0
1,1-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0
Ethyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0
2-Hexanone	ug/L	<12.5	<12.5	<12.5	<12.5
Iodomethane (Methyl Iodide)	ug/L	<5.0	<5.0	<5.0	<5.0
Methacrylonitrile	ug/L	<5.0	<5.0	<5.0	<5.0
Bromomethane	ug/L	<5.0	<5.0	<5.0	<5.0
Methylene Chloride	ug/L	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone (MIBK)	ug/L	<12.5	<12.5	<12.5	<12.5
Methyl methacrylate	ug/L	<5.0	<5.0	<5.0	<5.0
Propionitrile	ug/L	<50.0	<50.0	<50.0	<50.0
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	ug/L	<1.0	<1.0	<1.0	<1.0

Date Collected		1/8/03	4/9/03	7/24/03 7/9/03	10/8/03
Analyte	**Units**				
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0
Trichloroethene	ug/L	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	ug/L	<1.0	<1.0	<1.0	<1.0
1,2,3-Trichloropropane	ug/L	<5.0	<5.0	<5.0	<5.0
Vinyl Acetate	ug/L	<5.0	<5.0	<5.0	<5.0
Vinyl Chloride	ug/L	<1.0	<1.0	<1.0	<1.0
Xylenes	ug/L	<1.0	<1.0	<1.0	<1.0
BASE NEUTRAL COMP. 8270					
Hexachlorobenzene	ug/L	<10	<10	<10	<10
PCBs, M 8080					
Aroclor 1016	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1221	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1232	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1242	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1248	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1254	ug/L	<0.20	<0.20	<0.20	<0.20
Aroclor 1260	ug/L	<0.20	<0.20	<0.20	<0.20
VOLATILES - 504.1					
1,2-Dibromo-3-chloropropane	ug/L	<0.02	<0.02	<0.02	<0.02
Ethylene dibromide	ug/L	<0.02	<0.02	<0.02	<0.02
Antimony, ICPMS	mg/L	<0.0060	<0.0060	<0.0060	<0.0060
Arsenic, ICPMS	mg/L	<0.040	<0.020	<0.020	<0.080
Barium, ICP	mg/L	0.093	<0.080	0.078	<0.500
Beryllium, ICPMS	mg/L	<0.0040	<0.0040	<0.0040	<0.0040
Cadmium, ICPMS	mg/L	<0.0040	<0.0040	<0.0040	<0.0040
Calcium, ICP	mg/L	3,570	3,260	3,210	4,080
Chromium, ICPMS	mg/L	0.127	0.214	0.178	0.16

Date Collected		1/8/03	4/9/03	7/24/03 7/9/03	10/8/03
Analyte	**Units**				
Cobalt, ICPMS	mg/L	0.0119	0.008	0.0081	0.0092
Copper, ICP	mg/L	<0.060	<0.080	<0.040	<0.100
Iron, ICP	mg/L	<0.30	<0.40	<0.200	<0.500
Lead, ICPMS	mg/L	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium, ICP	mg/L	1,190	1,090	1,130	1,170
Manganese, ICP	mg/L	19.9	15.8	16.7	17.6
Nickel, ICP	mg/L	<0.030	0.069	0.06	0.061
Potassium, ICP	mg/L	21	23.2	25.5	26.5
Selenium, GFAA	mg/L	0.009	<0.010	<0.0050	<0.100
Silver, ICP	mg/L	<0.12	<0.160	<0.080	<0.200
Sodium, ICP	mg/L	888	821	910	1020
Thallium, ICPMS	mg/L	<0.004	<0.004	<0.004	<0.004
Vanadium, ICP	mg/L	<0.15	<0.200	<0.100	<0.250
Zinc, ICP	mg/L	<0.15	<0.200	<0.100	<0.250

Notes:

North Sewers Operable Unit
Five-Year Review Report
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Attachments:

Figure Nsewers-1	Site Location
Correspondence	May 24, 2004 letter from T. Van Donsel to R. Mason (RMI) and T. Steib (Detrex) regarding the implementation of institutional controls.

List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
HCB	Hexachlorobenzene
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination problem at the North Sewer Operable Unit of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the closure, grouting and replacement of three storm and industrial outfall process sewers that contained sediment with elevated levels of PCBs and other organic constituents

The assessment of this five-year review found that the remedy is functioning as designed. The scope of the cleanup was limited to actions necessary to protect Fields Brook from recontamination from sediment within the sewers. Since the sewers have been closed and grouted and are no longer in use, there is no mechanism for the sediment within the sewers (now fixated) to move to the brook. The immediate and long-term threats to Fields Brook from contamination in the North Sewers have been addressed and the remedy implemented for this operable unit is protective of human health and the environment in terms of preventing recontamination to Fields Brook. No O&M monitoring is required.

Five-Year Review Report
North Sewers Source Control Operable Unit

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the North Sewers Source Control Operable Unit. The Ohio Environmental Protection Agency (OEPA) provided support in the development of this five-year review.

This is the first five-year review for the North Sewers Operable Unit of the Fields Brook Site. The cleanup of the North Sewers was initiated in September 2000 and completed in October of 2000. U.S. EPA issued a letter on May 14, 2001, approving the completion of Remedial Action and the submittal of the Remedial Action Report.

II. Site Chronology

Event	Date
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS.	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigated possible source control areas.	1992 – 1995
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed 6 individual source control areas, including the North Sewers	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the North Sewers RD/RA.	December 1997
Approval of Remedial Design for North Sewers	June 1, 2000
Abandonment of Sewer Lines	September – October, 2000
U.S. EPA approves Completion of Remedial Action Report	May 14, 2001

III. Background

Physical Characteristics

The North Sewers are located in the northwest portion of the industrialized area near Fields Brook. See Figure NSewers-1. Three sewers were identified as part of this operable unit:

- **Combined Sewer** - The RI identified this sewer as a 48-in diameter reinforced concrete combined storm and facility outfall sewer. The sewer was later found to be 42 inches in diameter. The sewer is approximately 2,400 ft in length and runs along the west side of State Road, north of Fields Brook. The sewer is partially blocked in certain parts by debris which includes bricks, wood, sediment, and pieces of concrete.

- **Storm Sewer** - The RI identified a 5-in. vitrified clay storm water sewer that is approximately 250 ft in length. It runs from the southwest corner of the intersection of State Road and East 6th Street, south to join the north end of the combined sewer on the west side of State Road, north of Fields Brook. This sewer was later determined to have a 6-in. diameter.

- **Detrex Outfall Sewer** - This sewer connected the Detrex facility with the 48-in combined sewer. A portion of the sewer was constructed of PVC and was relatively free of sediment. This PVC sewer section discharged to a manhole that contains an older

section of sewer line that crosses under State Road to connect to the 48-in. diameter combined sewer.

Land and Resource Use

- **Combined Sewer** - The sewer accepted surface and facility outfall water, which at several locations included both plant surface water, process water and sanitary effluent. On-site treatment of sanitary waste was handled by all facilities that discharged to the sewer. No untreated effluent water entered the combined sewer system. The combined sewer collected outfall water from three facilities (the former Occidental Chemical facility, RMI Sodium, and Detrex) through three outfalls located at East 6th Street and State Road.

- **Storm Sewer** - This sewer line collected storm water from the RMI Sodium property and discharged into a manhole located at the former Occidental Chemical outfall.

- **Detrex Outfall Sewer** - This sewer transferred water from the Detrex water treatment system to the 48-in. diameter combined sewer.

History of Contamination

The Source Control Remedial Investigation found that sediment in these storm and outfall process facility sewers were a source of potential recontamination to Fields Brook.

- **Combined Sewer** - Sediment samples from the 48-in diameter combined sewer had concentrations of benzo(z)pyrene and hexachlorobenzene that ranged from 1.9 ppm to 11 ppm and 13 ppm to 5,800 ppm, respectively.

- **Storm Sewer** - A sediment sample from this storm sewer had a 5.4 ppm concentration of benzo(a)pyrene.

- **Detrex Facility Outfall Sewer** - A sediment sample was collected within a manhole on the east side of State Road in the northwest corner of the Detrex property. This manhole is between the Detrex facility sewer and the 48-in. diameter combined sewer that eventually discharges to Fields Brook on the west side of State Road. The sediment sample was collected from the bottom of the manhole where the sediment accumulates. This sediment had concentrations of 1,1,2,2-tetrachloroethane, 1,1,-dichloroethene, tetrachloroethene, benzo(a)pyrene, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, heptachlor and gamma-BHC (Lindane).

Initial Response

In late 1986, the U.S. EPA began negotiating with a number of Potentially Responsible Parties (PRPs) to conduct the source control RI/FS activities and sediment operable unit design activities. The PRPs are comprised of the companies who are considered owners and operators of the chemical industries and waste disposal sites surrounding Fields Brook. The PRPs also include companies who, by contract, agreement, or other means, either accepted, or arranged for transport, disposal or treatment of, hazardous substances within the Fields Brook site.

In 1989, the PRPs were issued a Unilateral Order to design a remedy for the Fields Brook sediments, complete a RI to identify the sources of contamination, and develop and evaluate cleanup alternatives for the sources of contamination. From 1992 to 1995, the PRPs evaluated 94 areas of potential contamination within the Fields Brook watershed to determine whether they were a source of past contamination or could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater.

As a result of this evaluation, the PRPs identified five industrial properties as sources of contamination to Fields Brook. The industrial properties include Detrex, Millennium Plant II $TiCl_4$ (formerly SCM), Acme Scrap Iron and Metal, RMI Metals, and Conrail. In addition, several sewer systems located to the north and south of Fields Brook were also found to be potential sources of contamination. Detailed information about the types and extent of contamination at the source areas can be found in the Source Control RI reports. The final Phase 1 Source Control RI was approved in May of 1997.

In conjunction with the preparation of the Source Control Remedial Investigation report, the PRPs prepared a Source Control FS to identify and evaluate cleanup alternatives. The Source Control FS was finalized in June, 1997. The report describes the initial screening of alternatives, the identification of a range of remedial alternatives, and the detailed analysis of the assembled alternatives for each of the five properties and the sewer systems.

Basis for Taking Action

The Source Control RI and FS reports form the basis for U.S. EPA's cleanup strategy, as selected in the 1997 Source Control ROD. These reports have been included in the information repositories and the Administrative Record.

IV. Remedial Actions

The primary selected remedy for the North Sewer source control area required the cleaning of the sewers. If the sewers could not be cost-effectively cleaned, sewer sections would be fully grouted to contain sediment and debris within the pipe. Specifically, the remedy included the following activities.

a) Cleaning of Sewer Lines and Catch Basins

For portions of the sewer that can be cleaned, the remedy required the removal of sediment and debris from inside the sewer lines and the associated catch basins to reduce the potential of recontamination of the Fields Brook sediments in excess of cleanup goals (CUGs). Sediment removal could be accomplished by cleaning the inside of the sewer using manual and mechanical techniques to remove sediment, followed by rinsing. Selection of the equipment to be used was to be based on the size and conditions of the sewer lines at the time of work activities. The equipment selected should be capable of removing sediments, dirt, grease, rocks, and other foreign materials. Mechanically powered cleaning equipment consists of belt-operated buckets and a power rodding

machine that are powerful enough to remove sediments and large debris from the sewer lines. Rinsing equipment should include a high velocity gun for washing and scouring sewer walls and floors.

b) Sediment Containment

Sewer sections that could not be cost-effectively cleaned were to be filled with grout to contain contaminated sediment and debris. The sediments in this sewer segment would be contained by filling the sewer pipe with a cement grout to restrict flow in the sewer and prevent migration of sediments into Fields Brook. The sewer segment would be plugged at both ends before grouting proceeds. Lean cement grout or fly ash grout would be used to grout the inner space of the sewer. Grouting would be accomplished from both ends and at several locations along the sewer pipe. Grout holes could be drilled at the crest of the sewer pipe through the overburden. Grout pipes would be inserted through the grout holes to pump the grout. Vents would be installed to allow air and water in the sewer to escape as it is replaced with the grout material. Sections of the existing sewer line that were to be grouted were to be abandoned and replaced with a new sewer diversion line.

c) Institutional Controls

Institutional controls are to be implemented to control excavation into sewers that have been sealed to contain contaminants and to define handling and disposal requirements for such sewers.

Remedy Implementation

The PRPs for the North Sewers utilized URS Corporation for remedial design and construction management of the remediation. The PRPs evaluated the possibility of cleaning and restoring the existing sewers. However, because of the depth and condition of the sewers and the large amount of utility lines running near the sewers, the PRPs determined that it was more practical to close the sewers and build new sewer lines. Because the Source Control ROD accepted either approach, U.S. EPA supported the abandonment of the North Sewers. The remedial design for the abandonment work was approved on June 1, 2000. Based upon discussions held during the remedial design process, it was agreed that grouting to a minimum depth of 6 inches would sufficiently fixate the accumulated sediment. This would be done in conjunction with plugging the end of the combined sewer and all connections, and constructing replacement sewer lines.

Prior to the abandonment of the North Sewer, each facility completed rerouting of stormwater and wastewater that formerly discharged into the North Sewer. Because the construction of replacement storm sewers was not within the scope of the remedial action, U.S. EPA and the USACE did not oversee the design and construction of the new sewer lines.

The abandonment of the North Sewers was completed during September and October of 2000, with the Completion of Remedial Action report approved on May 14, 2001.

The former Detrex outfall was abandoned on Detrex property when the new outfall was installed. The old line was not grouted, but a large section was cut and removed to allow for the

installation of the slurry wall on the Detrex property. Connections to a former RMI outfall and a former Occidental Chemical outfall were accessible through manholes, and closed by brick and mortar. The 6-in. storm sewer was plugged with a commercial expansion plug. The 6-in. storm sewer was located in a common manhole with the former Occidental Chemical outfall. After the brick and mortar closure of the Occidental Chemical and RMI outfalls had cured, concrete was poured into the manholes to a level corresponding with the ground surface.

In addition to the closure of connections for sewers entering the North Sewer, the North Sewer outfall to Field Brook was also closed. As part of the remedial action, a wooden form was constructed around the North Sewer outfall at Fields Brook and the pipe was filled with concrete, forming a plug five feet in length.

Within the North Sewer itself, lean concrete grout was poured into the sewer through vertical access shafts. At each shaft enough grout was poured into achieve a depth of 6 inches, sufficient to immobilize sediment within the sewer. In addition to the grouting, concrete was poured at thee access shaft locations to ensure adequate sewer closure.

System Operation/Operation and Maintenance

The North Sewers have been abandoned and no further monitoring or maintenance is required. The sewer ends and connections were capped, the length of the sewers were grouted to prevent future use, and replacement sewers were constructed.

V. Progress Since the Last Five-Year Review

This is the first five-year review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA and the potentially responsible parties for the Acme Scrap and South Sewers source control area, were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Richard Mason, RMI Titanium Company

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of this five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook. Because there will be no O&M data for the North Sewers OU, the need for community interviews for the North Sewers OU will be assessed at the time of the review based on land use and institutional control considerations.

Document Review/Data Review

The following documents were reviewed:

- Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997; and
- Remedial Action Construction Quality Assurance Report, dated January 31, 2001.

A site inspection of the Fields Brook Site, including the North Sewers Operable Unit, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. The abandonment of the sewers has addressed concerns about accumulated sediment moving from the sewers to the brook. Since the North Sewers have been closed and grouted, sediment and debris accumulated in the sewers can no longer flow into Fields Brook.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes. The Remedial Action Objective for the North Sewers is still valid. The goal of the cleanup was to eliminate sources of possible recontamination to Fields Brook.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

As part of the review of the North Sewers file, it was discovered that no institutional controls were put in place for the involved properties, as required by the ROD. The North Sewers PRPs have been directed to implement the institutional controls on the property deeds to control excavation into sewers that have been sealed and to define handling and disposal requirements for such sewers.

VIII. Issues

The remedial action is sufficient to protect the brook from recontamination from accumulated sediment in the sewers.

An inconsistency was identified between the Source Control ROD and the remedial design. Although the 6-in. storm sewer was not grouted as specified in the Source Control ROD, its connection to the North Sewer was plugged and the manhole filled with concrete. The remedial design approach sufficiently addresses concerns about movement of contamination into the brook.

Institutional controls will need to be put in place to ensure future workers in the area are aware of the abandoned sewers and take appropriate measures during excavations.

IX. Recommendations and Follow-up Actions

In a May 24, 2004 letter, U.S. EPA Region 5 has directed the North Sewers PRPs to implement institutional controls, pursuant to the requirements of the Source Control ROD. Because the PRPs do not own the parcels, they will need to coordinate with the landowners and use best efforts to place the notices on the deeds. The institutional controls are to be put in place by August 24, 2004.

X. Protectiveness Statement

The remedy implemented for the North Sewers Source Control operable unit is protective of human health and the environment, in terms of preventing recontamination of Fields Brook. Although the source control remedial actions were not developed to address human health or ecological risks within each source control area, no human health or ecological concerns have been identified regarding the grouting and containment of sediment within unused sewers. Institutional controls should be put in place to control excavation into the sewers and to define handling and disposal requirements for such sewers.

XI. Next Review

The next five-year review for the North Sewer Operable Unit of the Fields Brook Superfund Site is required by June 2009, five years from the date of this review.

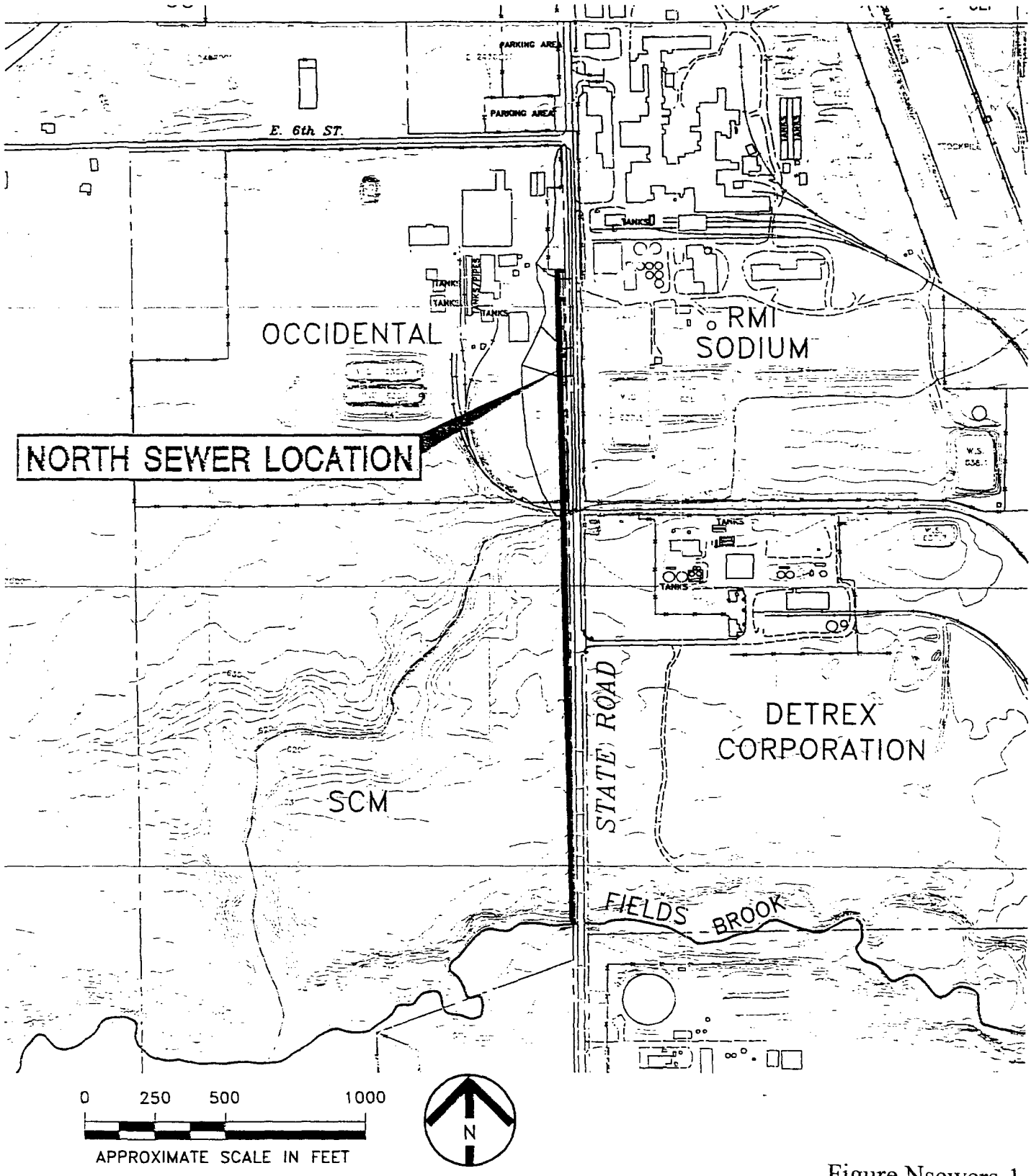

Figure Nsewers-1

SITE MAP

NORTH SEWER REMEDIAL ACTION ACTIVITIES

DRAWN BY: TBC	CHECKED BY: KMA	PROJECT NUMBER: 38-8E06013	DATE: 9/27/00	FIGURE NO: 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

May 24, 2004

REPLY TO THE ATTENTION OF

Via Certified Mail
Return Receipt Requested

SR-6J

Mr. Richard L. Mason
Director of Environmental Affairs
RMI Titanium Company
P.O. Box 269
1000 Warren Avenue
Niles, OH 44446-0269

Mr. Thomas Steib
Detrex Corporation
1100 N. State Road
Ashtabula, OH 44004

Subject: **Implementation of Institutional Controls**
U.S. EPA Docket No. V-W-98-C-446
Fields Brook Superfund Site - North Sewers Source Area
Ashtabula, Ohio

Dear Mr. Mason and Mr. Steib:

As part of the five year review for the North Sewers Operable Unit of the Fields Brook Superfund Site, U.S. EPA has found that institutional controls were never implemented for the areas where grouted sewers were left in place. The Source Control Record of Decision required that institutional controls were to be implemented to control excavation into sewers that have been sealed to contain contaminants and to define handling and disposal requirements for such sewers.

After the issuance of the December 1997 Unilateral Administrative Order, the U.S. EPA met with the potentially responsible parties for the North Sewers operable unit, and modifications were made to the order. Paragraph 62 of the order was removed, but this dealt with the requirement that the Respondents were to record the notice of the Order within five days of the effective date of the order. The elimination of this paragraph did not eliminate the Respondents responsibility to implement the institutional controls identified in the Scope of Work for the Order.

U.S. EPA therefore requires the Respondents to work with the current landowners and put in place appropriate notices on the deeds for the impacted parcels by August 24, 2004. If you have

any questions, please contact me at (312) 353-6564.

Sincerely,

Terese A. Van Donsel
Remedial Project Manager

cc: Peter Felitti, EPA-ORC
Regan Williams, OEPA
David Steele, Glenn Springs Holdings
Bill Falsgraff, Baker & Hostetler
Site File - N. Sewers ✓

Acme Scrap Iron and Metals and South Sewers Operable Units
Five-Year Review Report
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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OEPA	Ohio Environmental Protection Agency
O&M	Operations and Maintenance
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination problem at the Acme Scrap Iron and Metal and the South Sewer Operable Units of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the excavation of PCB-contamination soil in September of 2000, with long-term monitoring to ensure that residual PCB-contamination does not move into Fields Brook in excess of cleanup goals.

The assessment of this five-year review found that the remedies selected for the Acme Scrap and South Sewers source control operable units are functioning as designed. The scopes of the cleanups were limited to actions necessary to protect Fields Brook from recontamination. The immediate and long-term threats to Fields Brook from contamination at the Acme Scrap and South Sewers operable units have been addressed and the remedies have been determined to be protective of human health and the environment.

Five-Year Review Report
Acme Scrap Iron & Metal

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the Acme Scrap Iron and Metal Source Control Operable Unit. The Ohio Environmental Protection Agency (OEPA) provided support in the development of this five-year review.

This is the first five-year review for the Acme Scrap Operable Unit of the Fields Brook Site. The cleanup of the Acme Scrap property was initiated and completed in September 2000. U.S. EPA issued a letter on March 17, 2003, approving the completion of the remedial action and the submittal of the Remedial Action Construction Quality Assurance Report.

The purpose of the cleanup at the Acme Scrap operable unit was to address PCB-contaminated soils that had the potential to erode into Fields Brook. In addition, the Acme remedial action included the cleaning of the property's storm sewers, commonly known as the South Sewers, to remove accumulated sediment that could adversely impact Fields Brook. The storm sewer from the Acme property still empties into Fields Brook. Sediment that accumulates in the discharge pipe is collected on a quarterly basis with a temporary weir and is analyzed for PCBs. Since not all eroded soils are collected in the storm sewer system, samples are also collected from a drainage ditch on site. To date, concentrations of PCBs have been below levels that could cause an exceedance of the cleanup goal for the brook. Monitoring requirements will continue at Acme Scrap Iron and Metal to ensure that soil erosion into the storm sewer system does not lead to the release of sediment in excess of the brook cleanup goals.

II. Site Chronology

Event	Date
Acme Scrap property owned by U.S. government	Late 1940's
Site operated as a calcium carbide manufacturing facility	1943 - 1952
Site was vacant	1952 - 1974
Acme purchased the property	1974
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigate possible source control areas	1992 - 1995
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed 6 individual source control areas, including Acme Scrap and the South Sewers	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the Acme Scrap and South Sewers RD/RA	December 1997
U.S. EPA approved the Remedial Design for the Acme Scrap and South Sewers operable units	August 30, 2000
Performance of the Remedial Action	September 2000
Acme Scrap purchased by Lakeside Industrial Park and Railyard, Inc.	December 2001
U.S. EPA approved the 12/28/2000 Remedial Action Construction Quality Assurance Report for Acme Scrap and South Sewers	March 17, 2003

III. Background

Physical Characteristics

The Acme property is located in the southwest portion of the industrialized area near Fields Brook. Structures at the site include former manufacturing plant buildings, loading and unloading areas, drum storage areas, and an oil retention lagoon.

The South Sewer operable unit consists of a 36 to 48-inch diameter sewer east of State Road which runs between the Acme facility and Fields Brook, as well as a 30-inch outfall sewer that connects the oil retention pond on the Acme property to the catch basin at the corner of the intersection of State and Middle Roads. See Figure Acme-2.

Land and Resource Use

The site is currently vacant, but was previously a scrap recycling facility. The site was owned by the U.S. Government in the late 1940's and was later sold to National Carbide Corporation. Specific industrial activities by the U.S. Government and National Carbide are not known. However, the Acme site was operated as a calcium carbide manufacturing plant from 1943 until 1952. The facility was then vacant until 1974, when Acme purchased the property. The property was purchased in December 2001 by Lakeside Industrial Park and Railyard, Inc. (Lakeside). Lakeside has leased the northern section of the property for the operation of a cement/asphalt plant and is evaluating possible industrial development options for the remainder of the property, which includes the response area.

History of Contamination

In the past, Acme dismantled and recycled transformers to recover copper, aluminum, and steel for resale as scrap metal. On several occasions, the cutting operation used to dismantle the transformers would set the residual oil on fire. Oil containing PCBs may have been released into the environment from the transformers during this process. A preliminary assessment of the Acme facility in 1985 identified the chemicals of interest to include PCBs and several metals, including aluminum, arsenic, copper, iron, lead, mercury and zinc.

Initial Response

In late 1986, the U.S. EPA began negotiating with a number of Potentially Responsible Parties (PRPs) to conduct the source control RI/FS activities. The PRPs are comprised of the companies who are considered the owners and operators of the chemical industries and waste disposal sites surrounding Fields Brook. The PRPs also include the companies who, by contract, agreement, or other means, either accepted, or arranged for transport, disposal or treatment of, hazardous substances within the Fields Brook site.

In 1989, the PRPs were issued a Unilateral Order to design a remedy for the Fields Brook sediments, complete a RI to identify the sources of contamination, and develop and evaluate cleanup alternatives for the sources of contamination. From 1992 to 1995, the PRPs evaluated 94 areas of potential contamination within the Fields Brook watershed to determine whether these areas were a source of past contamination or could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater.

As a result of this evaluation, the PRPs identified five industrial properties as sources of contamination to Fields Brook. The industrial properties include Detrex, Millennium Plant II TiCl4 (formerly SCM), Acme Scrap Iron and Metal, RMI Metals, and Conrail. In addition, several sewer systems located to the north and south of Fields Brook were also found to be potential sources of contamination. Detailed information about the types and extent of contamination at the source areas, including Acme, can be found in the Source Control Remedial Investigation (RI) reports. The final Phase 1 Source Control RI was approved in May of 1997.

In conjunction with the preparation of the Source Control RI report, the PRPs prepared a Source Control FS to identify and evaluate cleanup alternatives. The Source Control FS was finalized in June, 1997. The report describes the initial screening of alternatives, the identification of a range of remedial alternatives, and the detailed analysis of the assembled alternatives for each of the five properties and the sewer systems.

Basis for Taking Action

Evaluations of PCB concentrations in the storm sewer system at the Acme property and in the surface soils led U.S. EPA to believe that Acme was a potential source of recontamination to the brook. Remedial actions for the Acme Scrap Iron and Metal property and the associated South Sewers were selected in the 1997 Source Control ROD.

IV. Remedial Actions

Remedy Selection - Acme Scrap and Iron Property

The selected remedy for the Acme property (from the September 29, 1997 Source Control ROD) included the excavation of soil with PCB concentrations greater than or equal to 50 ppm. The ROD called for the excavated soil to be either disposed of at the on-site landfill or at an off-site landfill, whichever is more cost-effective. More specifically, the selected remedy included the following components:

a) Clear Scrap, Debris and Vegetation / Remove Physical Hazards

In order to implement the remedial action, scrap, debris and vegetation were to be cleared in response and work areas. Physical hazards (i.e., unstable building sections) that could threaten workers also had to be addressed prior to implementation of the remedial action.

b) Excavation of Soils with Total PCB Concentrations ≥ 50 ppm

This ROD required excavation of soils with total PCB concentrations greater than or equal to 50 ppm. Based on existing data, it appeared that limiting excavations to a depth of approximately 1 foot would remove all TSCA-regulated soil. However, the remedy required removal of all TSCA-regulated soils (≥ 50 ppm PCBs), regardless of depth. Therefore, if areas of additional contamination were to have been identified, the excavation depth would have been adjusted accordingly. The ROD specified that additional soil samples were to be collected during the remedial design phase to further delineate the design remedial response area and ensure that the PCB contamination is not present on other areas of the Acme property.

Based on RI/FS data, it was estimated that the excavation area covered approximately 47,000 square feet. Excavation in this area would be conducted to a depth of approximately 1 foot. Excavation to a depth of 1 foot would have resulted in an estimated volume of 1,800 cubic yards.

Upon excavation, the soil was to be placed in lined roll-off containers or dump trucks for transportation to either the on-site landfill or to an off-site landfill. Verification sampling could be required to ensure removal of TSCA-regulated soils. Following completion of excavation activities, the excavated areas were to be backfilled with clean soil and graded to allow for adequate drainage. Any disturbed areas not receiving an erosion control

c) Refinement of Area to Be Covered

As part of the remedial design, soil loss calculations were to be reviewed to finalize the area to be covered. The cover areas have been developed based on current operations and include the proposed excavation area since it is located within the cover interior. The areas may be altered during remedial design if assumptions on future operations are revised and/or the remedial design includes consolidation.

d) Construction of Cover, Surface Drainage Controls

For the cover areas, the erosion control cover materials consists of a 12-inch thick layer of clean soil, an erosion control blanket and will be vegetated to reduce the potential for erosion. For anticipated future traffic areas, a 6-in. gravel layer underlain by geotextile was used instead of the soil.

Remedy Selection - South Sewers

The South Sewers discharge into Fields Brook and contained contaminated sediment. There was concern that this accumulated material could move into the brook and lead to exceedances of sediment and soil cleanup standards. The Source Control ROD identified the following actions as being necessary to eliminate the risk of recontamination of Fields Brook from the South Sewers:

a) Removal of sediment and debris from inside the sewer lines and the associated catch basins.

b) For any portions of sewers that are blocked and difficult to clean, these sections were to be closed off, and the sediment within the sewers contained. The sediments in these sewer segments was to be contained by filling the sewer pipe with a cement grout to restrict flow in the sewer and prevent migration of sediments into Fields Brook.

c) For areas where sewers are to be closed-off, replacement sewers are to be constructed to connect the remaining sections of the sewers that have been cleaned.

Remedy Implementation - Acme Scrap Iron and Metal

The cleanup requirements at the Acme Scrap property were based on expected erosion of Acme soils through the storm sewer system to Fields Brook. Therefore, the cleanup standard was determined based on an evaluation of anticipated erosion from the property. Pre-design studies concluded that soils with contamination equal to or greater than 50 ppm would need to be removed to ensure that erosion would not lead to an exceedance of the PCB cleanup goal at the brook. Design studies also found that with the removal of soils with 50 ppm or greater PCBs, no cover would be required to ensure erosion would not exceed the cleanup standard at the brook. The PRPs for the Acme Scrap property selected Morrison Knudson Corp. (now known as Washington Group International) for the remedial design and construction management tasks associated with the cleanup.

Because the Acme Scrap Iron and Metal was an operating facility, U.S. EPA encouraged the Acme PRPs to expand the cleanup beyond what was required for Fields Brook to reduce on-site PCB concentrations in soils below the 50 ppm level that was determined to be required to protect Fields Brook. This additional work was beyond the scope of the Fields Brook source control

cleanup, but U.S. EPA felt it important to raise the issue to the Acme PRPs and provide them the opportunity to efficiently deal with the residual on-site contamination as part of the Superfund remedial work. The Acme Scrap PRPs elected not to expand the soil excavation beyond those areas with 50 ppm.

As part of the cleanup design, supplemental sampling was performed to clearly delineate PCB contamination areas so that verification sampling would not be necessary. The remedial design for the Acme Scrap property was reviewed by U.S. EPA and the U.S. Army Corps of Engineers (USACE). U.S. EPA approved the remedial design on April 17, 2000 and the Remedial Action Work Plan on August 30, 2000. Construction commenced on September 11, 2000 and was completed on September 26, 2000. Field oversight was performed the USACE. Approximately 2,085 cubic yards of PCB-contaminated soil was excavated and disposed in the Fields Brook on-site landfill. U.S. EPA issued a letter on March 17, 2003, approving the completion of the remedial Action and the submittal of the Remedial Action Report.

Remedy Implementation - South Sewers

As part of the remedial design for the South Sewers (which was included as part of the Acme Scrap RD), the PRPs for the South Sewers made a video inspection of the sewers and determined that the sewers could be effectively cleaned. Because of the limited amount of sediment witnin the sewers, it was agreed that a follow-up video inspection would not be required. U.S. EPA approved the remedial design on August 30, 2000. Morrison Knudson was utilized by the PRPs as the prime contractor for remedial design and remedial action. Morrison Knudson collected the wash liquids and sediment that accumulated from the hydraulic cleaning of the sewers. Each length of sewer line was cleaned a minimum of two times. Approximately 12,000 gallons of wash water was collected and sent to the Fields Brook water treatment system for treatment prior to discharge to Fields Brook. Collected sediment was transported to the Fields Brook landfill for disposal. The cleaning of the sewers was performed in September 2000. As noted above, U.S. EPA issued a letter on March 17, 2003, approving the completion of the remedial action and accepting the report documenting the work performed at the site.

System Operation and Maintenance - Acme Scrap Iron and Metal

Because PCB-contaminated soil remains on site at the Acme Scrap property, long-term monitoring is required. Sediment samples from three locations were collected biannually from the fall of 2001 through 2003, and are now collected annually to ensure that residual PCB contamination from the Acme property is not moving off-site at concentrations that could lead to an exceedance of the PCB CUG in Fields Brook. According to the approved O&M Plan, U.S. EPA will assess the need for the continuation of sampling beyond 2005. The three monitoring locations are, as follows:

Sample location #1 — The south sewer at the outfall to Fields Brook. A removable weir (approximately 4 - 6 inches high) was installed inside the mouth of the South Sewer outfall. The weir is placed in the sewer pipe about one month prior to sampling to trap a sufficient amount of sediment for laboratory analysis. After sample collection the weir is removed. This is a compliance monitoring location.

Sample location #2 The northwest corner of the property at the intersection of Middle and State Roads. Overland stormwater runoff from the Acme Scrap site, not captured by the underground stormwater collection system, discharges from the property and collects within the drainage ditch located in this area. This is a compliance monitoring location.

Sample location #3 The outlet pipe of Acme Scrap Metal stormwater retention pond (the inlet to the pipe of the South Sewers). The retention and outlet pipe is located approximately 550 feet southeast of the intersection of Middle and State Roads. A removable weir (approximately 4 - 6 inches high) is installed inside the mouth of the South Sewer. The removable weir is placed in the sewer pipe about 1 month prior to sampling to trap a sufficient amount of sediment for laboratory analysis. After sample collection, the weir is removed. This is not a compliance monitoring location. The sample point provides information on the quality of sediment moving into the South Sewers prior to discharge at Fields Brook.

Monitoring has not shown any unacceptable concentrations of PCBs that could pose a threat of recontamination to the brook. See Table Acme-1 for results of monitoring conducted to-date.

System Operation and Maintenance - South Sewers

The South Sewers were fully cleaned and remain in use. Because the storm sewer outfall at Fields Brook is one of the three long-term monitoring points discussed above, the Operation and Maintenance for the South Sewers is addressed as part of the overall Acme facility O&M. In reality, since the storm sewers have been cleaned, the O&M is more a mechanism for evaluating recontamination of the sewers from the Acme property than it is a monitoring of the performance of the sewer cleanout remedy.

V. Progress Since the Last Five-Year Review

This is the first Five-Year Review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA and the potentially responsible parties for the Acme Scrap and South Sewers source control area, were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Jim Schwendeman, First Energy

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of this five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook. The need for community interviews regarding the Acme Scrap and South Sewers OUs will be determined at the time of the next five-year review, when additional O&M data is available and a decision will have been made regarding the need to extend O&M monitoring beyond the timeframe in the approved Operations, Maintenance and Monitoring Plan.

Document Review/Data Review

The following documents were reviewed:

- Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997;
- Remedial Action Construction Quality Assurance Report, dated December 12, 2000; and
- O&M Monitoring Reports - September 2001 to September 2003.

A site inspection of the Fields Brook Site, including the Acme Scrap property, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes, monitoring data collected to date confirms that the soils eroding from the Acme property (through the storm sewer system to the outfall at Fields Brook and in the drainage ditch at the northwest corner of the property) would not cause an exceedance of the PCB CUG in Fields Brook.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes, there has been no change to the PCB cleanup requirement for Fields Brook. The Remedial Action Objectives for the Acme Scrap Property and the South Sewers are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that would cause the Agency to question the protectiveness of the remedy in terms of contributions of PCBs to Fields Brook. U.S. EPA would like to note that the cleanup was limited to actions necessary to protect Fields Brook. During the design stage of the project, the Acme PRPs were encouraged to excavate additional soils that were contaminated with low-levels of PCBs. The excavation of these soils was not required by the remedial action, as the soil loss equations showed that the brook could be protected by excavated soils that met or exceeded 50 ppm total PCBs. The PRPs for the Acme

operable unit considered U.S. EPA's suggestion and opted not to excavate additional impacted soils. Thus, the cleanup remains protective in terms of contributions to Fields Brook. However, future land uses may be limited by the residual PCB contamination present at the property.

VIII. Issues

No issues have been identified. The remedial action is sufficient to address the scope of the cleanup which is to protect the brook from recontamination.

IX. Recommendations and Follow-up Actions

PCBs are being detected during O&M monitoring. Since some of the early detections approached the cleanup goal for PCBs (3.1 ppm), it is recommended that yearly monitoring continue at least through 2005. After the review of the additional 2 rounds of data (September 2004 and September 2005) required by the O&M Plan, U.S. EPA will assess the need for the continuation of O&M monitoring.

X. Protectiveness Statement

The remedies implemented for the Acme Scrap and South Sewers operable units are protective of human health and the environment, in terms of preventing recontamination of Fields Brook in excess of the PCB cleanup goal. No assessment was performed to determine whether the source control cleanups performed at the Acme Scrap and South Sewers operable units would be protective of human health and the environment for current and future exposure scenarios.

XI. Next Review

The next five-year review for the Acme Scrap Iron and Metal and the South Sewers Operable Units of the Fields Brook Superfund Site is required by June 2009, five years from the date of this review.

Table Acme-1

Results of O&M Sample
Presented as PPM total PCBs

Sample Date	Sample Location - South Sewer Outfall	Sample Location - (duplicate) South Sewer Outfall	Sample Location - NW Corner of Property	Sample Location - (duplicate) NW Corner of Property	Sample Location - Stormwater Outlet Pipe / South Sewer Inlet Pipe
9/20/2001	2.5	-	0.25	0.061	Not yet included as sample point.
3/7/2002	0.600	-	< 0.041	0.056	Not yet included as sample point.
10/15/2002	1.282	-	0.294	0.229	0.137
4/10/03	0.184	0.22	0.2	-	0.84
9/23/2003	0.050	-	0.031 J	0.018 J	0.23

AS-BUILT QUANTITY REPORT

ACME SCRAP IRON & METAL
ASHTABULA, OHIO

Item Number	Description	Quantity	Units
1	Draft Work Plan	1	LS
2	Incorporate EPA comments & finalize Work Plan	1	LS
3	Preconstruction Inspection & Meetings	1	LS
4	Mobilize & Demobilize equipment & labor	1	LS
5	Construct temporary roads, clear vegetation and debris	1	LS
6	Excavate contaminated soil & load trucks	2,100	BCY
7	Decontaminate and manifest trucks	1	LS
8*	Alternate Transportation & disposal of hazardous soils	3,780	TONS
9	Backfill & compact excavation	2,000	BCY
10	Furnish & install gravel surfacing over excavation areas	500	TONS
11	Plug & abandon specified storm sewer & basins	1	LS
12	Clean existing storm sewer to Fields Brook	1,370	LF
13	Prepare excavation record drawing & final report	1	LS
14	Abandon 2 wells per ODEQ requirements	2	EA

Table Acme-2

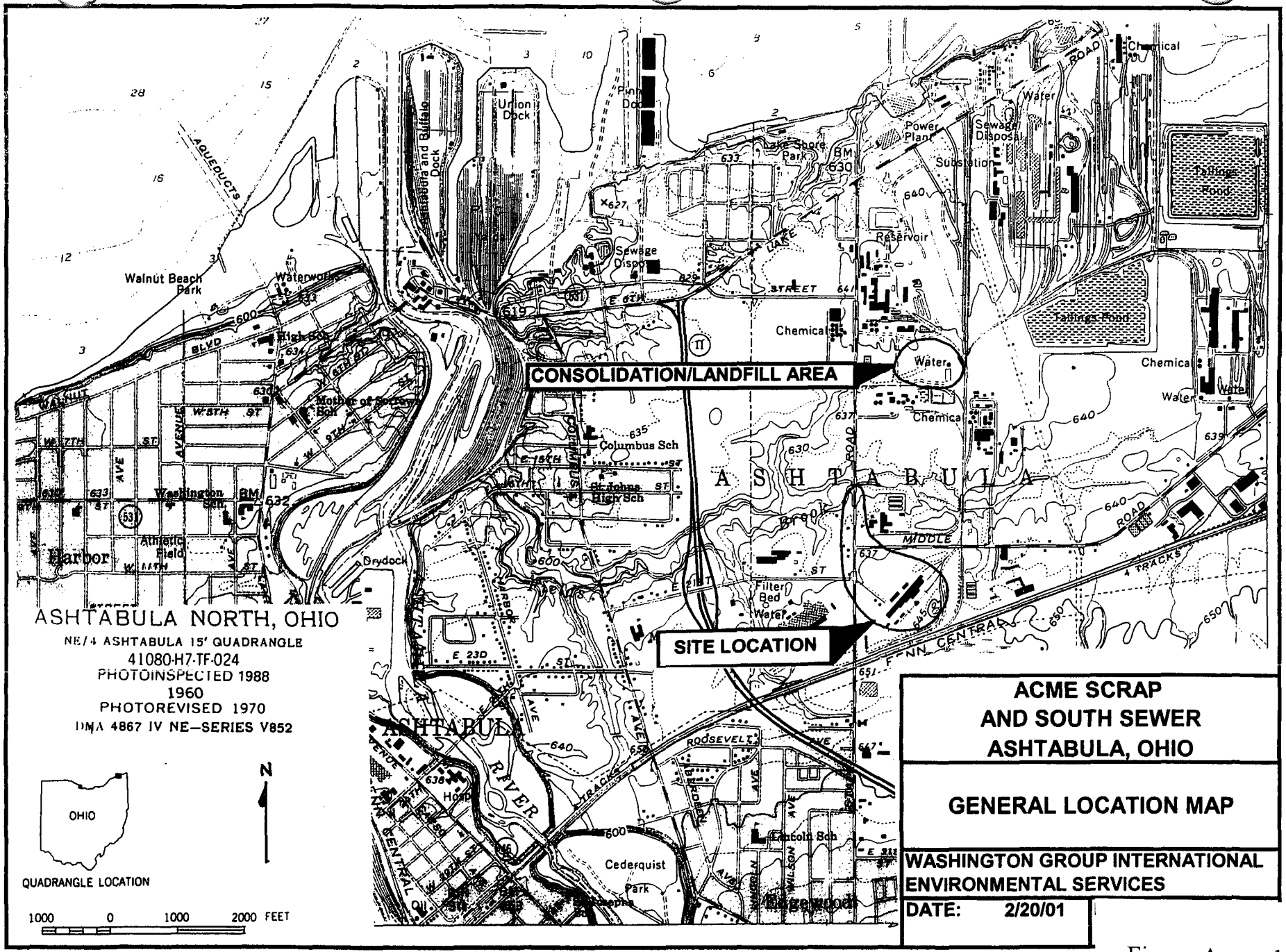

Figure Acme-1

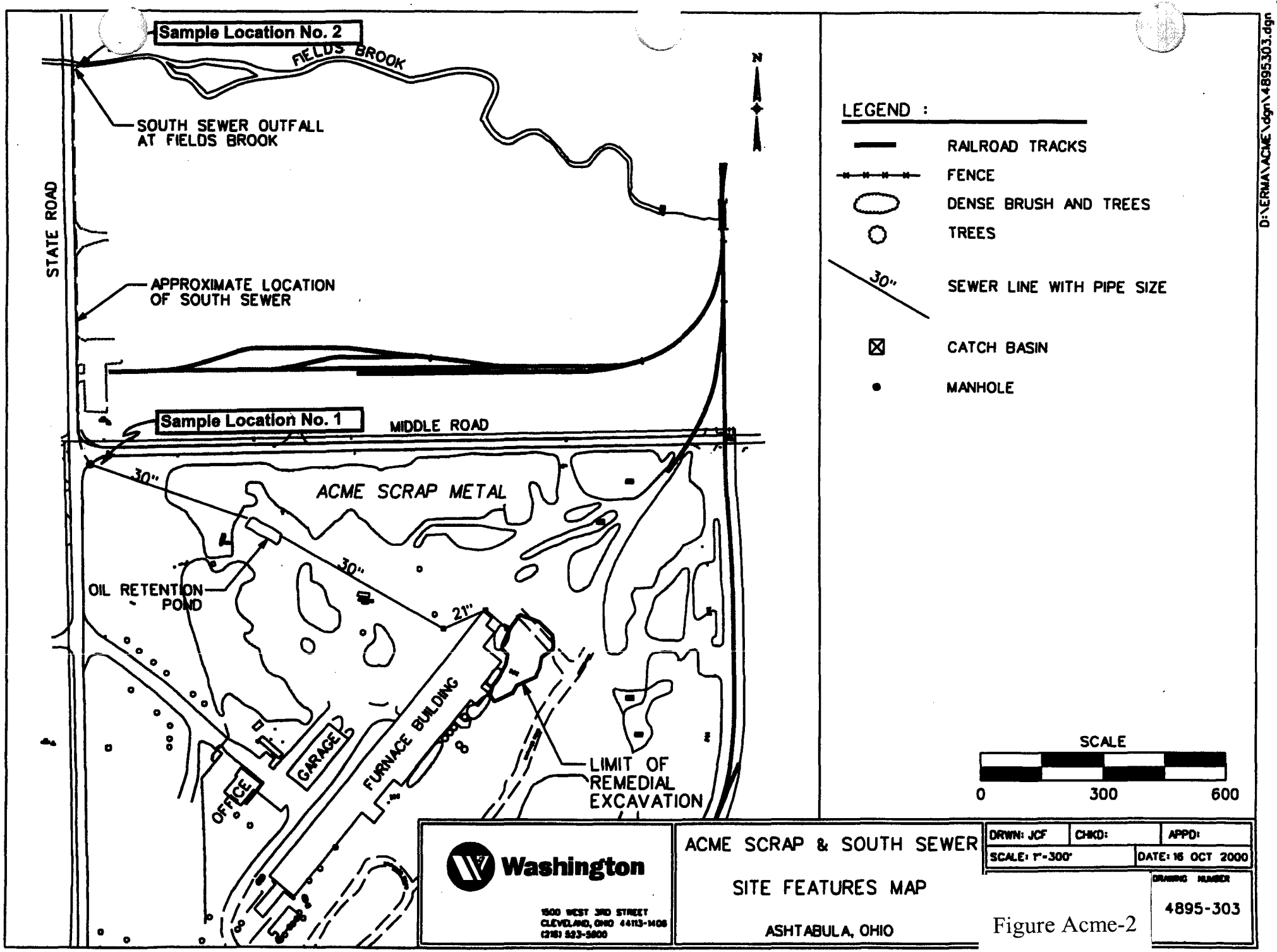

Figure Acme-2

EXCAVATION BOUNDARY COORDINATES

Point ID	Northing	Easting
OUTER PERIMETER		
A01	814439.3	2439935.1
A02	814436.0	2439934.4
A03	814427.4	2439929.2
A04	814407.7	2439927.0
A05	814382.3	2439926.9
A06	814350.3	2439918.6
A07	814315.7	2439890.2
A08	814295.2	2439882.4
A09	814297.0	2439886.1
A10	814283.3	2439897.2
A11	814337.9	2439979.6
A12	814366.9	2440000.8
A13	814378.2	2440014.6
A14	814422.4	2440033.3
A15	814446.0	2440025.5
A16	814477.2	2439992.1
A17	814478.6	2439967.6
A18	814449.8	2439940.8
A19	814444.6	2439838.0
INNER BOUNDARIES		
B01	814431.5	2439938.9
B02	814427.8	2439938.3
B03	814418.9	2439932.7
B04	814412.7	2439931.5
B05	814395.3	2439918.8
B06	814453.9	2440017.1
B07	814434.0	2439956.7
B08	814423.9	2439950.0
B09	814394.1	2439939.7
B10	814376.5	2439947.8
B11	814416.3	2439996.2
B12	814390.0	2440020.2
B13	814368.8	2439972.2
B14	814375.9	2439951.4
B15	814357.0	2439930.2
B16	814354.5	2439938.6
B17	814351.5	2439963.0
B18	814340.3	2439961.6
B19	814343.4	2439937.1
B20	814321.9	2439932.4
B21	814326.8	2439908.2
B22	814302.0	2439907.0
B23	814297.6	2439921.2

EXTENT OF EXCAVATION

SCALE 1" = 10'
0 10 20

LEGEND

- RAILROAD TRACKS
- FENCE
- DENSE BRUSH AND TREES
- TREES
- SURVEY REFERENCE POINT
- VERIFICATION SAMPLE LOCATION AND ELEVATION
- VERIFICATION SAMPLES OUTSIDE OF PLANNED EXCAVATION
- △A15 EXCAVATION PERIMETER COORDINATE POINT WITH ID
- ▽B15 INNER EXCAVATION BOUNDARY COORDINATE POINT WITH ID
- MONITORING WELLS AND BUMPER POSTS (SEE NOTE 1 BELOW)
- AREA EXCAVATED TO ELEVATION 638 FT
- AREA EXCAVATED TO ELEVATION 639 FT
- AREA EXCAVATED TO ELEVATION 639.5 FT
- AREA EXCAVATED TO ELEVATION 640 FT
- AREA EXCAVATED TO ELEVATION 641 FT

NOTES

1. MONITORING WELLS TO BE ABANDONED AND CUT BELOW PLANNED EXCAVATION DEPTH IN ACCORDANCE WITH OHIO REGULATIONS

Figure Acme-3

4895-04
4895-203

Conrail Source Control Operable Unit
Five-Year Review Report
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Figure Conrail-1	Location of Conrail Bridge Yard
Figure Conrail-2	Extent of Soil Remedial Response Area
Figure Conrail-3	Site Photo
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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
SCRI	Source Control Remedial Investigation
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination problem at the Conrail Bridge Yard Operable Unit of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the excavation of arsenic-contamination soil in December 1998, with no requirement for long-term monitoring.

The assessment of this five-year review found that based on the cleanup level implemented at the site, the remedy is functioning as designed. The scope of the cleanup was limited to actions necessary to protect Fields Brook from recontamination. The immediate and long-term threats to Fields Brook from contamination at the Conrail Bridge Yard have been addressed and the remedy is protective of human health and the environment.

Based on an evaluation of the cleanup performed at the Conrail property, U.S. EPA has determined that no additional five-year reviews are required for this operable unit of the Fields Brook Site.

Five-Year Review Report
Conrail Source Control Operable Unit

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, has conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the Conrail Source Control Operable Unit. The Ohio Environmental Protection Agency (OEPA) provided support in the development of this five-year review.

The purpose of the cleanup at the Conrail property was to address low-level arsenic-contaminated soil that had the potential to erode into Fields Brook and potentially lead to an exceedance of the arsenic cleanup goal. This is the first five-year review for the Conrail Source Control Operable Unit of the Fields Brook Site. The cleanup of the Conrail property was initiated and completed in December 1998. U.S. EPA issued a letter on April 17, 2000 approving the completion of the remedial action and the submittal of the Remedial Action Report.

II. Site Chronology

Event	Date
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS.	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigated possible source control areas.	1992 – 1995
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed 6 individual source control areas, including the Conrail Bridge Yard.	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the Conrail Bridge Yard.	December 1997
U.S. EPA approved Remedial Design for the Conrail Bridge Yard	October 6, 1998
Performance of Remedial Action	December 1998
U.S. EPA Approval of Remedial Action Project Report dated August 9, 1999	April 17, 2000

III. BACKGROUND

Physical Characteristics

Conrail's Bridge Yard is located north of Fields Brook, east of the Ashtabula River and west of a residential area within the City of Ashtabula, Ohio. Only a small portion of the Bridge Yard lies within the Fields Brook watershed. The area of interest includes a long (approximately 1600 ft), narrow strip of land along Fields Brook from 15th Street to the Ashtabula River. This area extends from the centerline of the southernmost set of railroad tracks south to Fields Brook.

Land and Resource Use

Conrail uses the bridge yard for marshaling or staging rail cars containing coal before and after loading and unloading rail cars. Features in the Bridge Yard area include numerous sets of tracks, a small lift bridge control (or yardmaster) building, and a small building that formerly housed a compressor. Main access to the area for vehicles is from the north; however, a light duty bridge east of the yardmaster building makes the property accessible from East 15th Street to the south. The light-duty bridge is currently closed with a metal barricade at each end. Trains enter and leave the Bridge Yard from the south end of the Yard near the confluence of Fields Brook and the Ashtabula River.

d) Institutional Controls, Chemical Monitoring and O&M

Institutional controls were to be implemented for any area where hazardous substances, pollutants or contaminants would remain above levels that allow for unlimited use and unrestricted exposure. For the Conrail Operable Unit, institutional controls were to be implemented to protect the cover system and drainage controls. Such institutional controls were to include, as appropriate, deed restrictions, security fencing, and signs.

Chemical monitoring requirements were to include the annual collection of surface soil arsenic samples. Maintenance would involve visual inspection of the gravel and riprap cover.

e) Points of Compliance

In conjunction with completion of the Remedial Action and performance of required O&M, erosion and runoff from the Conrail facility were required to meet residential Cleanup Goals (CUGs) established for the FWA and Sediment Operable Units. The extent and integrity of the cover must be maintained to contain soil that exceeds CUGs. At a minimum, the point of compliance is the property boundary.

Optional Implementation of Off-Site Disposal Alternative

In the 1997 ROD, U.S. EPA noted that a slightly more expensive alternative (requiring excavation and off-site disposal) would also be effective in reducing the movement of contamination to Fields Brook. U.S. EPA noted that enhancement of the remedy with off-site disposal is acceptable and may be advantageous to Conrail. There are benefits that cannot be readily itemized in a cost estimate, such as a reduction in long-term liability concerns, a shortened remedial design phase, and the elimination of U.S. EPA staff time required to track O&M compliance and review monitoring results.

Remedy Implementation

The Conrail Source Control OU was the smallest of all of the Fields Brook operable units. The Source Control ROD selected a remedy that included consolidation and containment because it was thought to be effective and was slightly cheaper than the excavation and off-site disposal option. However, because of the maintenance, monitoring and reporting requirements, Conrail decided that is was more practical to completely address the contaminated area, rather than have to deal with the long-term administration of the area. The Remedial Design for the Conrail OU was approved on October 6, 1998. The excavation was performed in December of 1998. Because Conrail wanted to complete their work as soon as possible, Conrail elected not to wait until the Fields Brook Landfill was available. Approximately 350 cubic yards of soil with low-level arsenic contamination were excavated and sent off-site for disposal. Since the cleanup removed soils above health-based cleanup level for arsenic, institutional controls were not triggered and O&M is not required. Because of the straightforward nature of this cleanup, U.S. EPA chose not to utilize the USACE for field oversight.

System Operations and Maintenance

Conrail exceeded the requirements of the ROD by excavating soil areas with elevated arsenic instead of consolidating and containing the soils. U.S. EPA is satisfied that this area has been sufficiently addressed, as soils were excavated to meet a residential cleanup level for arsenic. No further monitoring or maintenance is required.

V. Progress Since the Last Five-Year Review

This is the first Five-Year Review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

The Ohio EPA was consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of this five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook. Because U.S. EPA has determined that no further five-year reviews are required for the Conrail OU, future community interviews for the Fields Brook Site will not address the Conrail OU.

Document Review/Data Review

The following documents were reviewed:

- Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997;
- Remedial Action Project Report dated August 9, 1999.

A site inspection of the Fields Brook Site, including the Conrail operable unit, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. Although there is no monitoring required for this operable unit, the residential CUG for arsenic has not been changed. The property is still utilized for industrial purposes. Therefore, the cleanup to the residential CUG is sufficiently protective for the land use and to address erosion of Conrail soils into the brook.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes, there has been no change to the arsenic cleanup requirement for Fields Brook. The Remedial Action Objectives for the Conrail Source Control Operable Unit is still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that would cause the Agency to question the protectiveness of the remedy in terms of contributions of arsenic contributions to Fields Brook.

VIII. Issues

No issues have been identified. The remedial action taken is sufficient to address the scope of the cleanup which is to protect the brook from recontamination.

IX. Recommendations and Follow-up Actions

Because of the conservative nature of the arsenic cleanup level selected for the Conrail operable unit, U.S. EPA had previously determined that no long-term monitoring would be required for this operable unit. Because the Conrail cleanup met the residential cleanup goal, there is little concern that erosion from residual arsenic contamination could cause an exceedance of the residential cleanup goal within Fields Brook. The remedy implemented by Conrail did not leave soils on site above health-based levels. Therefore, no institutional controls or long-term monitoring are required. Furthermore, U.S. EPA has determined that five-year reviews be discontinued for this operable unit of Fields Brook.

X. Protectiveness Statement

The remedy is expected to be protective of human health and the environment, in terms of preventing recontamination of Fields Brook in excess of the arsenic cleanup goal. Although the scope of the Conrail source control cleanup was limited to protecting Fields Brook from recontamination and was not designed to address any human health or ecological risks at the property, the cleanup of the arsenic-contaminated soils to the residential cleanup level is conservative for an industrial property, even considering the assumptions made for floodplain residential exposure frequency.

XI. Next Review

The next five-year review for Fields Brook Superfund Site is required by June 2009, five years from the date of this review. However, U.S. EPA has determined that no additional reviews will be required for the Conrail Operable Unit.

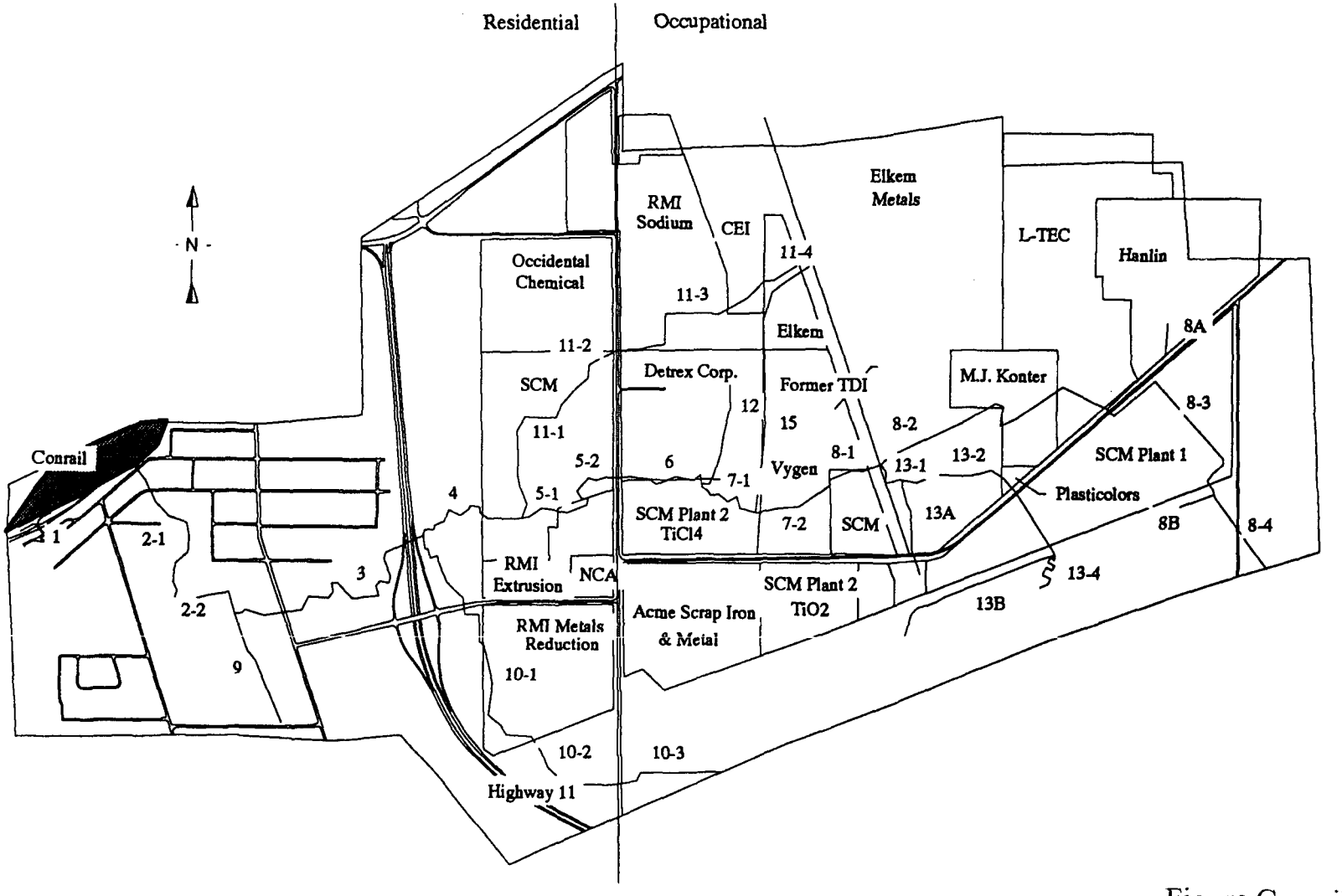


Figure Conrail-1

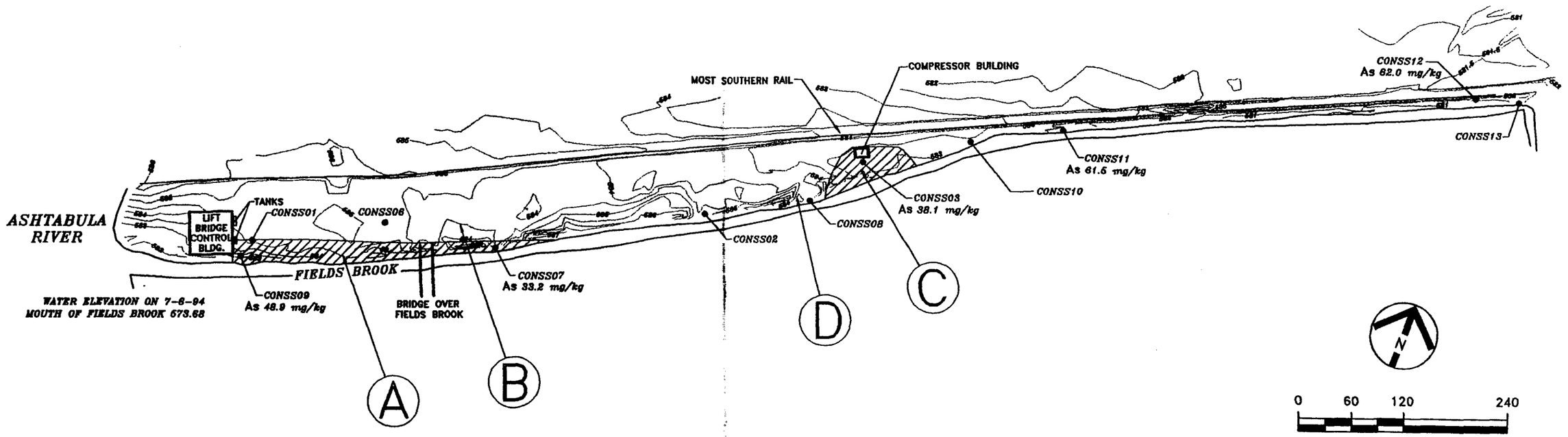
ft (1 in = 1867 ft)

0 2000 4000

2-1 Reach Number

Property Boundary

Facility Location and Reach Map



LEGEND

- (A) APPROXIMATE SAMPLING LOCATION, WESTERN EXCAVATION AREA
- (B) APPROXIMATE SAMPLING LOCATION, WESTERN EXCAVATION STOCKPILE
- (C) APPROXIMATE SAMPLING LOCATION, EASTERN EXCAVATION AREA
- (D) APPROXIMATE SAMPLING LOCATION, EASTERN EXCAVATION STOCKPILE
- • SOURCE CONTROL SURFACE SOIL SAMPLE (APPROX. LOCATION)
- ▨ ESTIMATED POTENTIAL REMEDIAL RESPONSE AREA
- As 48.9 mg/kg ARSENIC CONCENTRATION IN MILLIGRAMS PER KILOGRAM ONLY CONCENTRATIONS ABOVE CUGs ARE SHOWN

Woodward-Clyde Consultants
Engineering & sciences applied to the earth & its environment
30775 Bainbridge Road, Suite 200
Solon, Ohio 44139

CLIENT: FIELDS BROOK

LOCATION: ASHTABULA, OHIO

WASTE CHARACTERIZATION SAMPLE LOCATION CONRAIL BRIDGE YARD

DRAWN BY:	CHECK
MMS	

U:\3609S\CONRAIL\CONRB73C

Figure Conrail-2

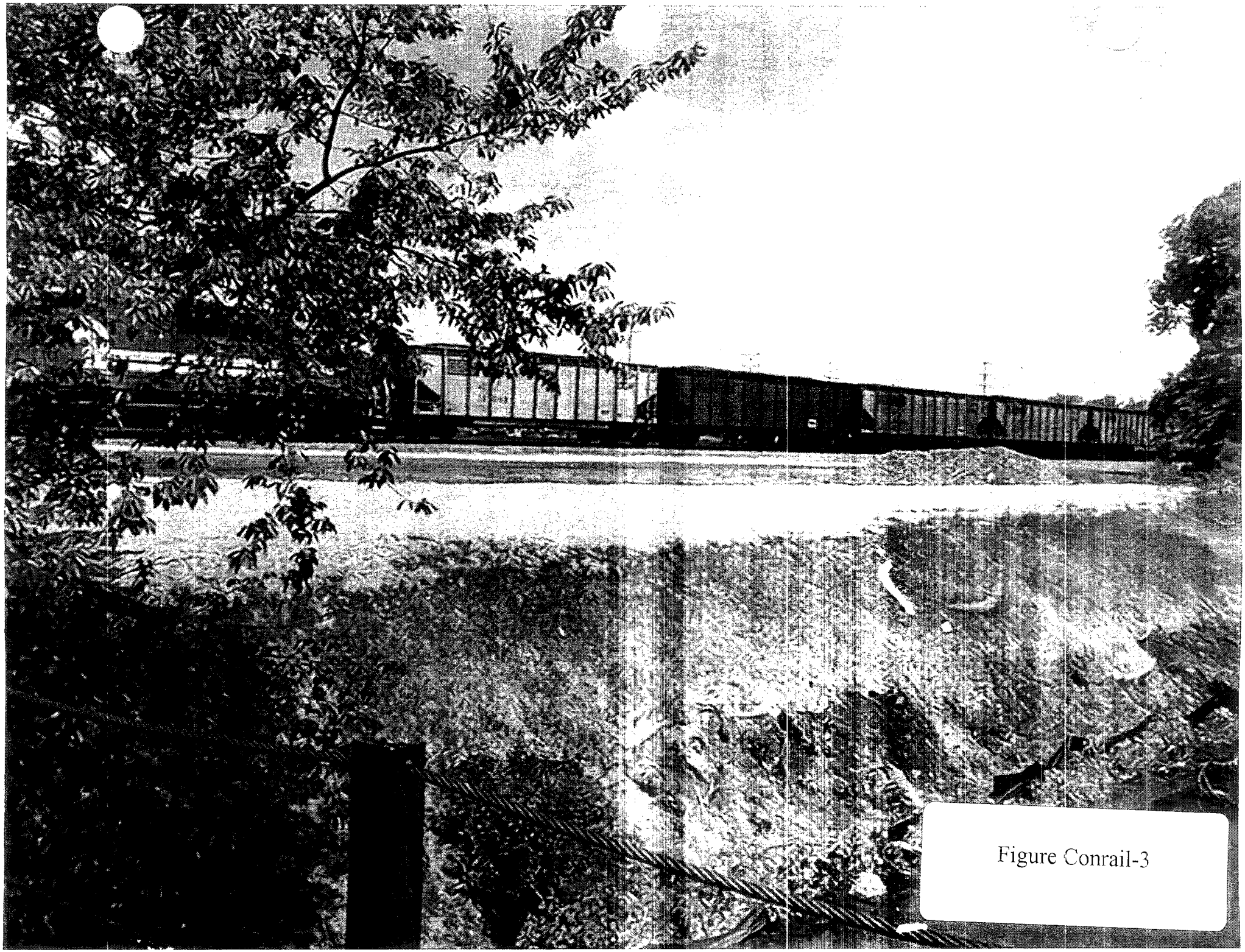


Figure Conrail-3

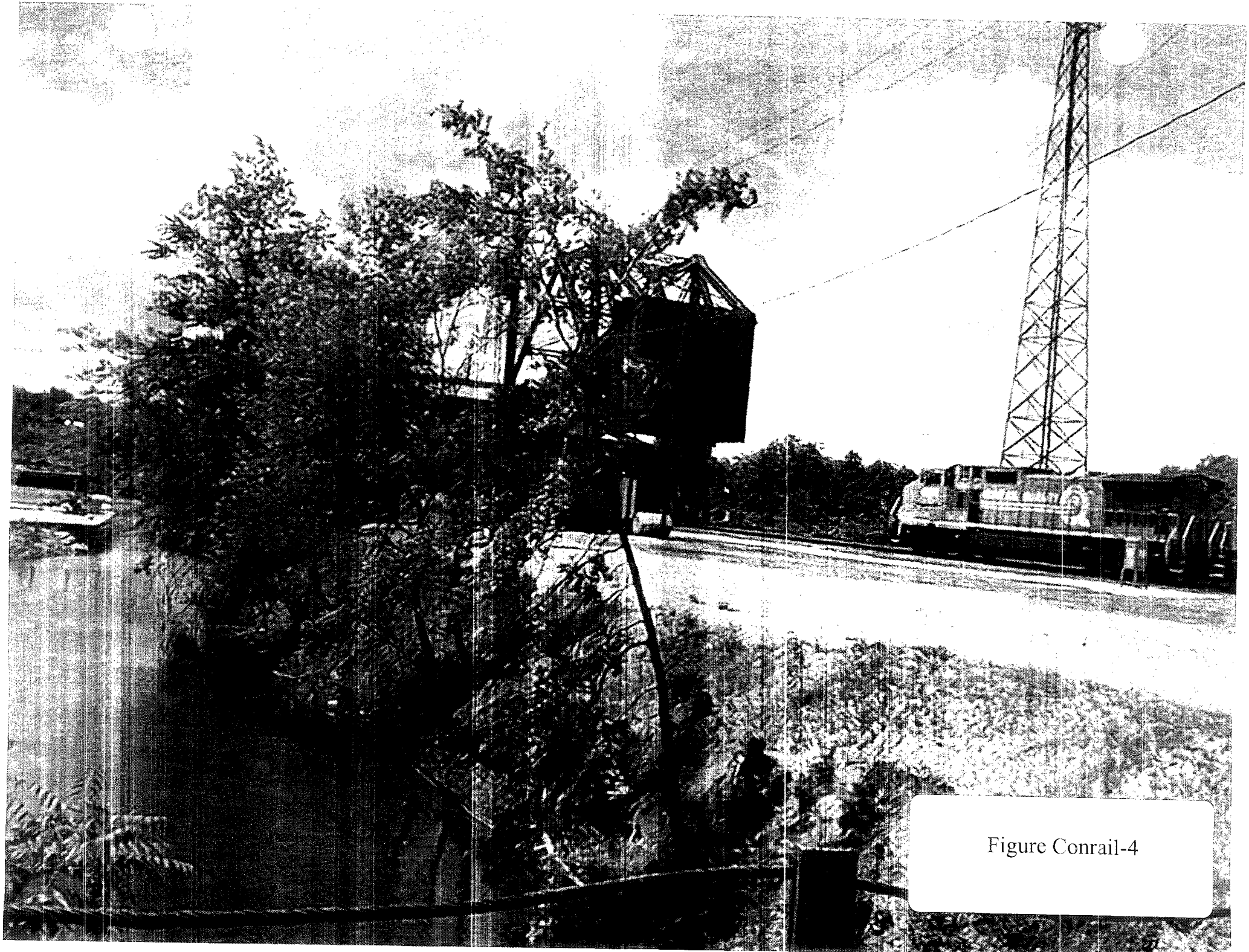


Figure Conrail-4

RMI Metals Operable Unit
Five-Year Review Report
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Attachments:

Figure RMI-1	Location of RMI Metals
Figure RMI-2	Extent of Soil Remediation

List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
Agency	United States Environmental Protection Agency
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CRG	Confidence Removal Goal
CUG	Cleanup Goal
ESD	Explanation of Significant Difference
FS	Feasibility Study
NPL	National Priorities List
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ODH / BRP	Ohio Department of Health / Bureau of Radiation Protection
OEPA	Ohio Environmental Protection Agency
OMM	Operation, Maintenance and Monitoring
OU	Operable Unit
PCBs	Polychlorinated biphenyls
PPB	Parts per billion
PPM	Parts per million
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
RMI	Reactive Metals Incorporated
U.S. EPA	United State Environmental Protection Agency

Executive Summary

The purpose of this five-year review is to determine if the remedy selected to address the contamination problem at the RMI Metals Operable Unit of the Fields Brook Superfund Site is protective of human health and the environment. The remedy included the excavation of PCB-contaminated soil. The Remedial Action commenced in May of 2001 and was completed in August of 2001. A cleanup level of 10 ppm total PCBs was met. No institutional controls or monitoring were required.

The assessment of this five-year review found that the remedy is functioning as designed. The scope of the cleanup was limited to actions necessary to protect Fields Brook from recontamination. The immediate and long-term threats to Fields Brook from contamination at the former RMI Titanium Company Metals Reduction Plant have been addressed. The 10 ppm cleanup level is protective of human health and the environment, in terms of preventing the recontamination of Fields Brook from erosion of soils at RMI Metals. Additionally, the 10 ppm cleanup level is consistent with the current industrial land use at the site.

Five-Year Review Report
RMI Metals

I. Introduction

The purpose of the five-year review is to determine whether the remedy implemented at a site is protective of human health and the environment. The methods, findings, and conclusions of such reviews are documented in Five-Year Review reports. Five-Year Review reports identify any issues and concerns found during the review, if any, and make recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The NCP at 40 CFR Section 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region5, conducted a five-year review of the remedial actions implemented at the Fields Brook Site in Ashtabula, Ohio. This report documents the results of the review for the RMI Metals Source Control Operable Unit. The Ohio Environmental Protection Agency (OEPA) provided support in the development of this five-year review.

This is the first five-year review for the RMI Metals Operable Unit of the Fields Brook Site. The cleanup of the RMI Metals property was initiated in May of 2001 and completed in August of 2001. A cleanup level of 10 ppm totals PCBs was met. U.S. EPA issued a letter on September 10, 2002 approving the completion of the remedial action and the submittal of the Remedial Action Report. No long-term maintenance or deed restrictions were required as part of the action.

II. Site Chronology

Event	Date
U.S. EPA initiated negotiations for the performance of a Source Control RI/FS.	1986
U.S. EPA issued a Unilateral Administrative Order for performance of a Source Control RI/FS	1989
Fields Brook PRPs investigated possible source control areas.	1992 – 1995
U.S. EPA approved the PRPs' Source Control RI	May 1997
U.S. EPA approved the PRPs' Source Control FS	June 1997
U.S. EPA issued the Source Control ROD, which addressed 6 individual source control areas, including RMI Metals.	September 29, 1997
U.S. EPA issued a Unilateral Administrative Order for the performance of the RMI Metals RD/RA.	December 1997
U.S. EPA approves Remedial Design	August 9, 2000
Commencement of soil excavation at RMI Metals	May 2001
Completion of soil excavation at RMI Metals	August 2001
U.S. EPA Approval of Final Report for RMI Metals Source Control Operable Unit #2	September 10, 2002
Sale of RMI Metals property to Ryber Development	May 2003
Termination of Unilateral Administrative Order except for record preservation and record retention requirements	July 18, 2003

III. Background

Physical Characteristics

The RMI Metals Reduction (RMI Metals) facility is located at the southwest corner of the intersection of State Road and East 21st Street. The RMI Metals property is bordered on the north by East 21st Street, North Coast Auto, and RMI Extrusion facilities, on the east by State Road and the Acme facility, on the south by undeveloped property, and to the west by Reach 10-1 of Fields Brook and State Route 10.

Land and Resource Use

The RMI Metals facility was used until 1992 to produce pure titanium metal (Ti) called Ti sponge. The facility was closed in 1992.

Initial Response

The results of the Recontamination Assessment presented in the Source Control RI Report indicated that it was not necessary to consider remedial alternatives for any potential source areas located at the RMI Metals facility in the FS. However, after preparation of the Source Control RI report, it was decided that additional surface soil sampling should be conducted in the vicinity of the potential source area where one elevated concentration (6.9 ppm) of PCBs was detected in during the RI sampling program. From this follow-up sampling, a potential source area was identified in the area of a former demolition debris landfill. As the result of two additional sampling and analysis efforts conducted in August and October 1995, it was mutually decided between RMI and the U.S. EPA that additional sampling would be conducted to refine and more completely delineate the remedial response areas for each remedial alternative. In addition to the identification of several PCB residential cleanup goal (CUG) exceedances in this vicinity, the area is also in close proximity to tributary of Fields Brook (reach 10-1). In follow-up sampling efforts conducted in August and October 1995, several additional surface soil samples collected in this area were found to have concentrations of total PCBs ranging from 0.9 ppm to 91.0 ppm.

Data presented in the Source Control RI Report and from subsequent sampling performed in 1995 for PCBs established preliminary limits of the remedial response area. This area was estimated to be approximately 3,900 sq. ft. (0.1 acre) in size. The remedial response area was estimated using a cleanup goal of 10.0 ppm for total PCBs.

History of Contamination

In late 1986, the U.S. EPA began negotiating with a number of Potentially Responsible Parties (PRPs) to conduct the source control RI/FS activities and sediment operable unit design activities. The PRPs are comprised of the companies who are considered the owners and operators of the chemical industries and waste disposal sites surrounding Fields Brook. The PRPs also include the companies who, by contract, agreement, or other means, either accepted, or arranged for transport, disposal or treatment of, hazardous substances within the Fields Brook site.

In 1989, the PRPs were issued a Unilateral Order to design a remedy for the Fields Brook sediments, complete a RI to identify the sources of contamination, and develop and evaluate cleanup alternatives for the sources of contamination. From 1992 to 1995, the PRPs evaluated 94 areas of potential contamination within the Fields Brook watershed to determine whether they were a source of past contamination or could cause future recontamination once the Brook cleanup is underway. Contamination could be caused by discharges from pipes, the movement of contaminated soil or sediment during rainstorms, and subsurface releases to the brook from flowing groundwater.

As a result of this evaluation, the PRPs identified five industrial properties as sources of contamination to Fields Brook. The industrial properties include Detrex, Millennium Plant II TiCl4 (formerly SCM), Acme Scrap Iron and Metal, RMI Metals, and Conrail. In addition, several sewer systems located to the north and south of Fields Brook were also found to be

potential sources of contamination. Detailed information about the types and extent of contamination at the source areas, including RMI Metals, can be found in the Source Control Remedial Investigation (RI) reports. The final Phase 1 Source Control RI was approved in May of 1997.

In conjunction with the preparation of the Source Control RI report, the PRPs prepared a Source Control FS to identify and evaluate cleanup alternatives. The Source Control FS was finalized in June 1997. The report describes the initial screening of alternatives, the identification of a range of remedial alternatives, and the detailed analysis of the assembled alternatives for each of the five properties and the sewer systems, including RMI Metals.

Basis for Taking Action

The Source Control RI report, the supplemental sampling performed by RMI, and the FS report formed the basis for U.S. EPA's cleanup strategy, as it was selected in the Source Control ROD.

IV. Remedial Actions

Remedy Selection

U.S. EPA's September 29, 1997 Source Control ROD selected a remedy for the RMI Metals operable unit that required excavation of soils with greater than or equal to 10 ppm total PCBs. However, selection of this alternative was based on the estimated volumes and costs presented in the FS. The ROD clarified that if additional sampling found the extent of soil contamination to be greater than previously known, cost estimates would be revised for the selected remedy and an alternate remedy (requiring excavation and off-site disposal of soils with 50 ppm or greater total PCBs and on-site consolidation and containment of soils with 10 ppm or greater total PCBs) could be considered. EPA could then reassess whether containment with long-term O&M would be a more cost effective alternative. Because of U.S. EPA's preference for permanent remedies that do not rely on O&M to maintain their effectiveness, U.S. EPA emphasized that any cost difference between the two remedies will need to be significant for U.S. EPA to approve implementation of the alternate remedy allowing on-site containment. The primary selected remedy for the site included:

a) Clear Debris and Vegetation / Remove Physical Hazards

In order to implement the Remedial Action, debris and vegetation was to be cleared in response and support areas. Physical hazards that could threaten workers were also to be addressed prior to the Remedial Action.

b) Excavation of Soils

In order to meet the 1.3 ppm total PCBs residential CUG at Fields Brook and its tributaries, the remedy required the excavation of soils with total PCB concentrations

greater than 10 ppm. Verification sampling would be required to ensure removal of TSCA-regulated soils and demonstrate compliance with excavation requirements.

c) Backfill / Regrading of Response Area

Following completion of excavation activities, excavated areas would be backfilled with clean soil or gravel and graded to allow for adequate drainage. Gravel fill would be used in areas subject to vehicle traffic.

d) Institutional Controls, Chemical Monitoring and O&M

No monitoring or institutional controls would be required for the primary alternative (which includes no on-site containment).

Remedy Implementation

The Remedial Design and construction management associated with the RMI Metals cleanup were performed by RMI employees operating under a consulting arm of their company (Earthline Technologies). U.S. EPA and USACE reviewed the Remedial Design plans. The Remedial Design was approved on August 9, 2000. The cleanup work included excavation of PCB-contaminated soils with disposal in the Fields Brook on-site landfill. Field oversight was performed by the USACE. Excavation began in May of 2001 and was completed in August of 2001. Verification sampling was guided in the field with the use of PCB field kits to provide quick assurance that excavation requirements were met. These field tests were followed-up with laboratory analyses to ensure the 10 ppm PCB cleanup level was met. The final report detailing the work performed was approved on September 10, 2002.

Approximately 8,976 cubic yards of soil were removed from the property to meet the 10 ppm cleanup level required by the Source Control ROD.

System Operations and Maintenance

The contaminated area of the RMI Metals property was remediated to meet a cleanup standard of 10 ppm total PCBs and then backfilled with clean soil. U.S. EPA determined that no additional monitoring or maintenance is required to ensure that this area does not pose a threat of recontamination to Fields Brook.

V. Progress Since the Last Five-Year Review

This is the first five-year review for the Fields Brook Site.

VI. Five-Year Review Process

Administrative Components

Potentially interested parties, including the Ohio EPA and the potentially responsible parties for the RMI Metals source control area, were consulted during the preparation of the five-year review. The members of the review team included:

Terese Van Donsel, RPM, U.S. EPA
Peter Felitti, Associate Regional Counsel, U.S. EPA
Regan (Sig) Williams, Ohio EPA
Richard Mason, RMI Titanium Company

Community Notification and Involvement

Notification was given to the Ohio Environmental Protection Agency that the five-year review was being prepared. A news release was issued on April 25, 2004 to all local news media.

No community interviews were conducted as part of this five-year review. Community interviews may be appropriate for the next five-year review, when O&M data is available for the brook. Because U.S. EPA has determined that no future five-year reviews are required for the RMI Metals OU, any future community interviews for the Fields Brook Site will not address the RMI Metals OU.

Document Review/Data Review

The following documents were reviewed:

1. Record of Decision for the Source Control Operable Unit of the Fields Brook Superfund Site, September 29, 1997;

2. Final Report for RMI Metals Source Control Operable Unit #2, dated August 29, 2001

A site inspection of the Fields Brook Site, including the RMI Metals property, was conducted on May 6, 2004.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes, the cleanup of PCB-contaminated soil to a level of 10 ppm is sufficient to be protective of the brook.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes, there has been no change to the PCB cleanup requirement for Fields Brook. The Remedial Action Objectives for the RMI Metals property are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The RMI Metals property was recently purchased by Ryber Development. The cleanup level is acceptable for current industrial land use. No new information has come to light that would cause the Agency to question the protectiveness of the remedy in terms of contributions of PCBs to Fields Brook.

VIII. Issues

No issues have been identified. The remedial action is sufficient to address the scope of the cleanup, which is to protect the brook from recontamination.

IX. Recommendations and Follow-up Actions

Because the cleanup level implemented to protect the brook from erosion of contaminated soil is also consistent with a health-based cleanup level for unrestricted land use (pursuant to TSCA voluntary cleanup standards), U.S. EPA determined that no institutional controls or long-term monitoring would be required for this operable unit. U.S. EPA recommends that five-year reviews be discontinued for this operable unit of Fields Brook.

X. Protectiveness Statement

The remedy implemented for the RMI Metals operable unit is protective of human health and the environment, in terms of preventing recontamination of Fields Brook in excess of the PCB cleanup goal. Although the source control remedial actions were not developed to address human health or ecological risks within each source control area, no human health or ecological concerns have been identified regarding the cleanup at RMI that met a "not-to-exceed" 10 ppm total PCBs cleanup level prior to backfill. The property use remains industrial, and the 10 ppm cleanup level is more conservative than what was implemented within the industrial area of the Fields Brook floodplain (where a confidence removal goal of 50 ppm total PCBs was used to achieve on average a target cleanup goal of between 6 and 8 ppm total PCBs).

XI. Next Review

The next five-year review for Fields Brook Superfund Site is required by June 2009, five years from the date of this review. However, U.S. EPA has determined that no additional reviews will be required for the RMI Metals operable unit.

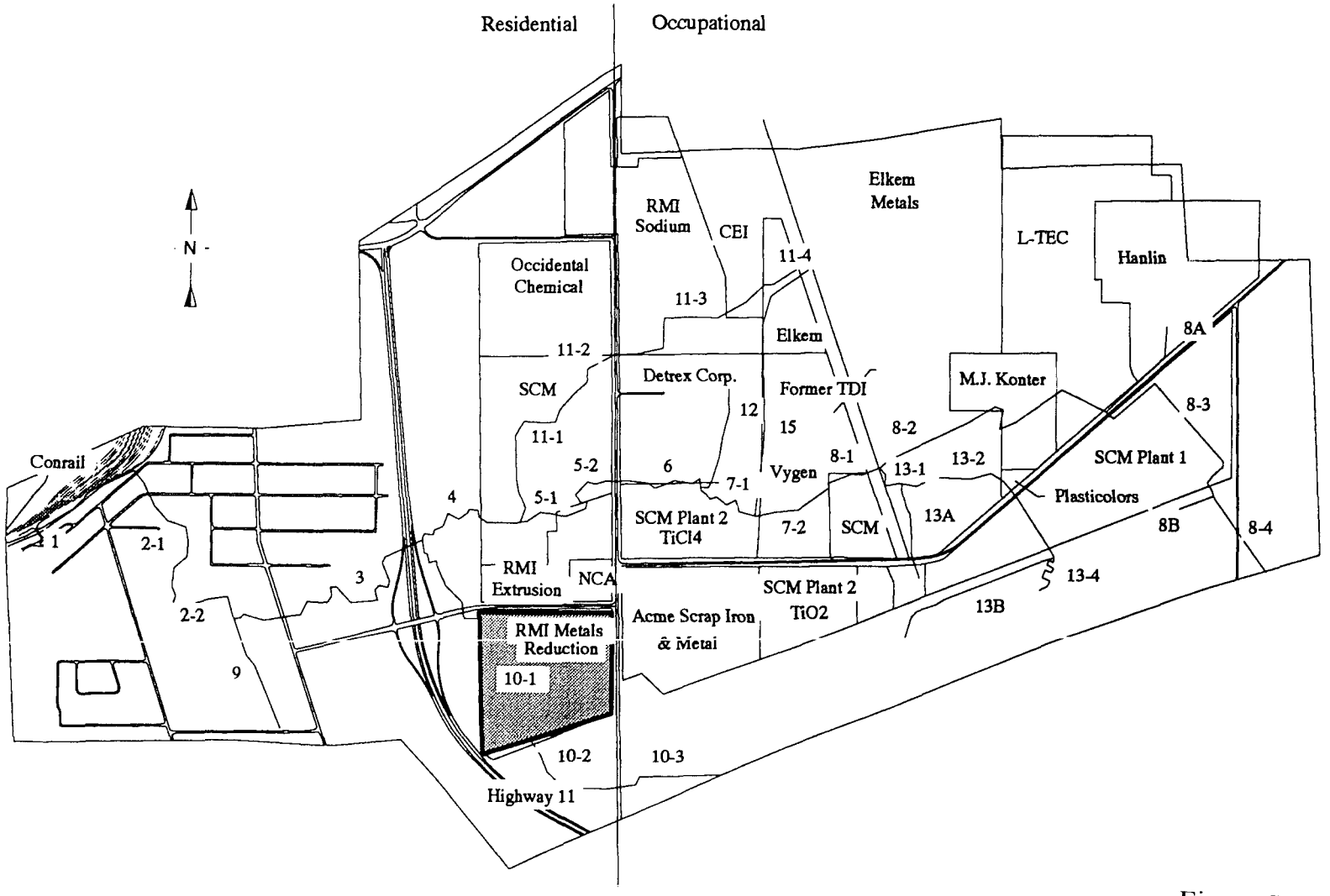


Figure RMI-1

ft (1 in = 1867 ft)

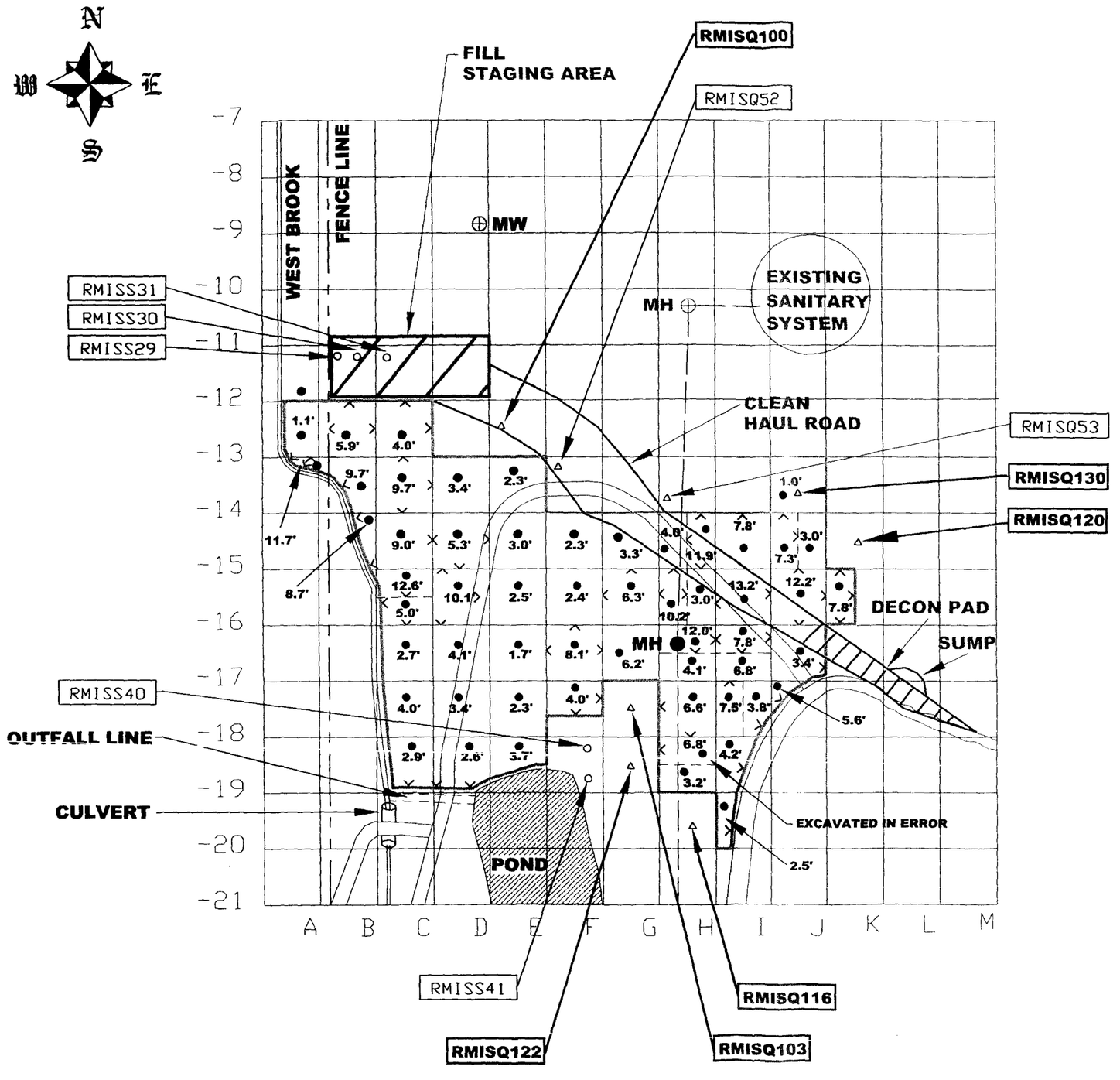
0 2000 4000

2-1 Reach Number

Property Boundary

Facility Location and Reach Map

Figure RMI-2



NOTE: GRID IS 10 METERS X 10 METERS.

LEGEND

•	CONFIRMATORY BOTTOM CLEAR * (COMPOSITE OF QUAD 1 & 4)
›	CONFIRMATORY SIDEWALL CLEAR *
*	CLEAR SAMPLE < 10 ppm TOTAL PCB'S
5.9'	AVERAGE EXCAVATION DEPTH BASED ON DIFFERENTIAL SURVEY
1.5'	APPROXIMATE EXCAVATION DEPTH BASED ON VISUAL OBSERVATION
● MH	MANHOLE - REMOVED AND REPLACED
⊕ MH	MANHOLE
⊕ MW	MONITORING WELL
———	EXISTING ROADWAY
— — —	SANITARY SEWER
———	WEST BROOK & POND
— · —	PROPERTY FENCE LINE
·····	EXCAVATION BOUNDARY

REMEDIATION CRITERIA

EXCAVATE AND DISPOSE OF CONTAMINATED SOILS WITH TOTAL PCB CONCENTRATION >10 ppm

REF DWG. 00-2068

REVISION		
REV. No.	DATE	DESCRIPTION
0	8/28/01	REVISED PER JOB #082801-1

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DATE	SCALE	DWN BY
8/8/01	1/32"=1'	KML

TITLE: RMI METALS OU #2 PCB EXCAVATION "AS BUILT"

REQUESTOR SIGNATURE: K. COLTMAN
ENGINEER SIGNATURE: K. COLTMAN
DWG. No. 00-2210 R